NETWORK WORLD

THE WEEKLY FOR LEADING USERS OF COMMUNICATIONS PRODUCTS & SERVICES VOLUME 4, NUMBER 40 OCTOBER 5, 1987

▶ *GROUP BUYING*

Co-op inks cut-rate PBX pacts

NEC, NTI sign to supply Amerinet.

BY KARYL SCOTT
Washington, D.C. Correspondent

ST. LOUIS, Mo. — Wielding the combined buying power of its 2,700-member health care companies, Amerinet last week announced contracts with NEC America, Inc. and Northern Telecom, Inc. to buy, at sharply reduced prices, as much as $500 million worth of private branch exchanges over the next three years.

Amerinet's action is indicative of a growing trend among users in vertical industries that are mustering their purchasing power to extract price concessions, in the form of volume discounts, from communications equipment and services vendors.

Last month, a consortium of independent insurance agencies and major insurance carriers signed a four-year, multimillion-dollar contract with MCI Communications Corp. for long-distance services. The nonprofit association that swung the deal for its members, the Insurance Value-Added Network Services Corp., was able to wrest a 10% discount from MCI on daytime telephone rates.

"The group purchase approach makes a great deal of sense for small users that would end up paying a lot more for equipment and services if they negotiated con-

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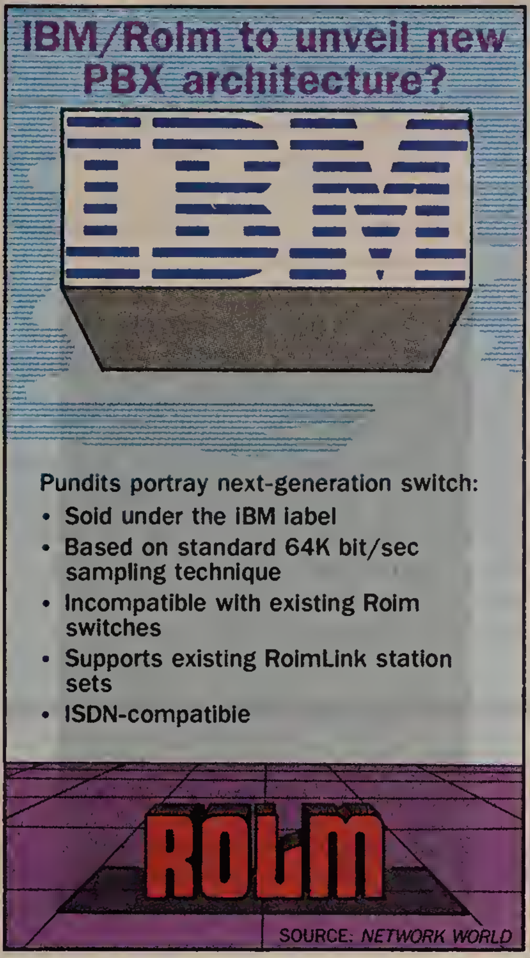
IBM/Rolm to unveil new PBX architecture?



Pundits portray next-generation switch:
- Sold under the IBM label
- Based on standard 64K bit/sec sampling technique
- Incompatible with existing Rolm switches
- Supports existing RolmLink station sets
- ISDN-compatible

SOURCE: *NETWORK WORLD*

▶ *SWITCH SHIFT*

IBM to revamp Rolm PBX design

Big Blue breaks with proprietary past.

BY PAM POWERS
Senior Editor

NEW YORK — After years of speculation on the part of users and industry watchers, IBM is expected this week to unwrap an ISDN-ready Rolm Corp. PBX, unofficially dubbed the CBX III, which sources say is based on a new architecture that is incompatible with Rolm's existing switches.

While IBM would not comment other than to confirm that it intends to introduce telecommunications equipment at a briefing here on Tuesday, users and industry consultants said details about the private branch exchange have been leaked.

It appears IBM has tackled one of the CBX's biggest problems by abandoning its proprietary architecture, which did not provide a clean migration path to Integrated Services Digital Networks. The CBX III also reportedly will have a smaller footprint and play a bigger role in IBM's Systems Network Architecture.

But the improvements will come at a price that has angered some users, who say it is too dear. While

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▶ *TCA WRAP-UP*

Users wary of AT&T strategy

BY BOB WALLACE
Senior Editor

SAN DIEGO — Many of the users who flocked to last week's Tele-Communications Association (TCA) 25th Annual Conference and Exhibition here said they are unwilling to give up control of their networks to take advantage of the one-stop shopping promoted by AT&T in two recently filed tariffs.

Users surveyed at the show, which boasted more than 550 exhibitors and roughly 15,000 attendees, were apprehensive about AT&T's Digital Tandem Switching Service (DTSS), which was ap-

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PRODUCT FOCUS

Bridges, gateways open to confusion

BY JOHN J. HUNTER
Contributing Editor

Gateways and bridges are becoming indispensable tools for network managers in this era of distributed processing and local-area networks. But selecting a gateway or bridge isn't as simple as it might appear.

For example, a vendor may claim that its bridge links Ethernets, but since not all versions of Ethernet are compatible, users could end up stuck with empty promises. Another potential problem: The delays introduced during packet filtering between

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NETWORK LINE

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▶ Using the TCA show as a backdrop, Tymnet/McDonnell Douglas unveils a desktop packet switch and its plans to become a single-source voice/data vendor. Page 2.

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▶ *PRIVATE NETS*

Access fees rock user strategies

FCC scheme haunts planning.

BY MARY PETROSKY
West Coast Correspondent

SAN DIEGO — Reeling from the news that they may be subject to access charges the Federal Communications Commission plans to impose on enhanced service providers, private net users here said they may be forced to redesign their networks to avoid substantial cost increases.

Communications managers who were interviewed by *Network World* at last week's Tele-Communications Association (TCA) 25th Annual Conference and Exhibition expressed concern that the FCC's access charge proposal

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TCA '87

Ten vendors join IBM's NetView demo at TCA

BY JOSH GONZE
Staff Writer

SAN DIEGO — Ten vendors last week joined hands with IBM at the Tele-Communications Association conference here to demonstrate how their proprietary network management systems can work in conjunction with IBM's NetView.

The vendors took part in an IBM-sponsored on-line demonstration in which alarms from their net management systems were handed off to NetView/PC consoles in each of their booths and forwarded over a multidrop leased line to a NetView-outfitted host at an IBM site in Raleigh, N.C. NetView responses were relayed back to the show floor via a dial-up line and displayed on a NetView console in Big Blue's booth.

Information displayed on the NetView console described which vendor's net management package generated the alarm and which network lines and components were at fault.

All the exhibitors participating, including IBM, reported strong user interest in the demonstration. Darrell Sell, vice-president of system products at Racal-Vadic, Inc., one of the 10 vendors, called it "the hottest item in the booth."

Other vendors participating were Dynatech Data Systems, General DataComm, Inc., Network Equipment Technologies, Inc., Timeplex, Inc., Racal-Milgo, Inc., StrataCom, Inc., TelWatch, Inc., Teleprocessing Products, Inc. and Digital Communications Associates, Inc. IBM provided each vendor with modems, drops on the primary leased line and a back-up line.

Three other vendors at the show, MCI Communications Corp., Data Switch Corp. and Paradyne Corp., announced NetView/PC interfaces for their network management systems but did not participate in the demonstration, saying they did not have enough time to prepare.

Central control

Attendees at the show said the NetView/PC demonstration was interesting because it showed how a network operator could centrally monitor alarms generated by a variety of equipment.

But users said they are looking forward to future NetView capabilities that will enable operators to control, as well as monitor, non-IBM equipment.

"All NetView/PC does is send alarms up to the mainframe," said Charles Antonini, a network manager representing Morton Thiokol, Inc. at the conference. "The mainframe operator still has to run

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TCA '87

Tymnet switch, voice/data plan bow

BY JIM BROWN
New Products Editor

SAN DIEGO — Tymnet/McDonnell Douglas Network Systems Co. last week introduced a desktop packet switch that supports all of the features of larger Tymnet engines and also spelled out plans to become a single-source vendor of voice/data network products.

The new low-end packet switch, coupled with other switch enhancements announced here at the Tele-Communications Association's annual conference, are meant to bolster the company's long-standing product line.

Tymnet will introduce a new switch family based on industry standard components — including VME buses and Motorola, Inc. microprocessors — at Telecom '87, the 5th World Telecommunications Exhibition in Geneva, Switzerland, later this month, according to Michael P. Cady, marketing director.

Cady also revealed a Tymnet plan to flesh out its product line by offering products that integrate voice and data. Tymnet recently signed an OEM agreement with Republic Telecom Systems Corp. for trunk expanders — devices used to squeeze voice and data circuits into existing private-line facilities — and has now begun a search for an OEM T-1 multiplexer supplier.

Tymnet rival Telenet Communications Corp. last spring announced Integrated Digital Network, a plan to offer end-to-end voice/data services using T-1 multiplexers from Timeplex, Inc., in-house packet-switching gear and T-1 transmission facilities provided by parent company US Sprint Communications Co.

Products released at the show include the eight-port MD 7408, giving the company a position in the low end of the packet-switching market, and the CPU III, a board-level product that increases the throughput of its existing line of packet switches by 20%.

The Tymnet MD 7408, also known as the Tymnet Nano Engine, can act as a packet switch as well as a packet assembler/disassembler for attached terminals, personal computers or hosts. It supports X.25, IBM Systems Network Architecture/Synchronous Data Link Control, IBM 3270 Binary Synchronous Communications and asynchronous protocols.

The Nano Engine, which is said to incorporate the intelligence of larger Tymnet engines, is equipped with 1M byte of random-access memory. Two of the unit's eight ports are capable of supporting speeds up to 64K bit/sec. The remaining six ports will support speeds up to 9.6K bit/sec, which is also the top asynchronous speed supported. Each port operates in half- or full-duplex.

The Nano Engine also supports local switching, the ability to link terminals and personal computers connected to one port directly to

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CONTRACT CONTROVERSY

Doelz vs. AT&T in $25m suit

Squabble concerns Bank of America.

BY PAUL KORZENIOWSKI
Senior Editor

SANTA ANA, Calif. — Doelz Networks, Inc. filed a $25 million suit against AT&T last month, claiming the company practiced unfair competition, induced a breach of contract and misappropriated trade secrets to win an equipment contract from Bank of America National Trust & Savings Association.

The civil suit, which was filed in California Superior Court here on Sept. 25, stemmed from a 1986 contract valued at $20 million that the bank allegedly awarded to Doelz and then retracted and awarded to AT&T.

An AT&T spokesman said the suit is without merit, and a Bank of America spokesman refused to comment on the case.

In its suit, Doelz claimed it received a letter from Bank of America officials on Aug. 18, 1986 committing to purchase roughly $4 million worth of Doelz products in the third and fourth quarters of 1986 alone.

The contract was one of several the bank awarded as part of an extensive overhaul of its voice and data networks.

AT&T, which had been chosen to act as a systems integrator for the bank network, contacted Doelz and said it needed technical information about the Doelz equipment so it could plan for its integration. The bank also called Doelz and asked the company to meet with AT&T.

AT&T officials, including three consultants named as defendants in the suit, met with Doelz on Aug. 24, according to Doelz. During the meeting, AT&T said it knew the bank had chosen Doelz's equipment and that AT&T did not plan to compete for the bank's data transport business, according to the suit.

Doelz also disclosed proprietary technical and financial information at the meeting, including the products' strengths and weaknesses, the cost of the system and ways in which the system could be im-

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Network World wants to make its news coverage even better, and for that we ask your help. If you know of an interesting event that just occurred or is about to occur, please call. We'd also like to know how you optimize your networks. Call Editor Bruce Hoard toll free at (800) 343-6474.

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ALCATEL

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▶ *INTERNATIONAL*

France frees VAN mart

Moves to end state telecom monopoly.

BY AMIEL KORNEL
IDG News Service
European bureau

PARIS — France has taken its first official step toward ending its state telecommunications monopoly with a series of decrees that permit private companies to offer value-added network services. The decrees hold good and bad news for IBM's French subsidiary, the only major firm to have announced intentions to enter the value-added net market.

Although little more than a baby step forward on the long road to communications liberalization, the rules released Sept. 25 set in motion a process that will slowly ease the state-owned Post, Telephone and Telegraph administration's grip on the services market.

IBM's French affiliate said at the end of June that it planned to create a joint network venture with French software and services group Sema-Metra and two major French financial institutions. The partners said in February 1986 they were studying the feasibility of such a venture.

An IBM Europe spokesman here said on Sept. 30 that the new company would be legally formed within the next few days but declined comment on the government's decrees until the firm had more time to study them.

IBM, targeting communications services as a strategic growth area in Europe, has already announced value-added net ventures in Italy, Spain and Denmark. On Sept. 3, the company revealed that it had entered into a joint research agreement with Sweden's L.M. Ericsson Telephone Co. focusing on development of so-called intelligent network products ("Firms probe integration," *NW*, Sept. 7). IBM critics have warned that the computer giant is preparing to extend its dominance to the communications arena. But both PTT and IBM officials were miffed by recent press reports that suggested the French decrees were written to limit IBM's mobility in the value-added net market. At the time of the June announcement, IBM Europe officials hinted they had received word from the government that the firm's efforts would not be blocked or hampered by the regulations.

One constraint cited by the press is the PTT's demand that all providers offer services using facilities that conform to the Open Systems Interconnect (OSI) framework within two years. IBM and PTT officials said this was not a surprise or a problem for IBM.

The PTTs, as well as most European communications vendors, have preached the OSI gospel for some time. And although IBM's predilection for its proprietary Systems Network Architecture is no secret, the company has repeatedly expressed its support for OSI and has developed products, particularly targeted to European users, to back up those claims. What's more, it seems unlikely that the French government would seek to keep IBM, the country's biggest taxpayer, out of any market.

Nonetheless, the voluminous decrees do hold good and bad news for IBM and other firms planning to enter the French value-added net market. Foremost among the good news, perhaps, is the absence of a volume-based tariff plan.

European governments face strong lobbying from labor unions worried about job loss in a competitive, liberalized communications market and from telecommunications agencies concerned that private service operators would encroach on their basic-transport turf. Seeking to calm those fears, the French PTT had hinted that, like such European counterparts as the West German Deutsche Bundespost, it would impose usage-based rates to regulate growth of the nascent value-added net market.

IBM and others argued vigorously against the imposition of volume-based rates, saying the rates would impair the economic feasibility of future value-added nets.

Their arguments seem to have been heard. The decrees preserve fixed rates on lines leased by network operators from the PTT.

But that doesn't mean the PTT resisted the temptation to plant a worm in the golden apple. The decrees stipulate that users' bills cannot include more than a 15% charge for basic transport service. Requiring 85% of a service's costs to come from added value should make the development and startup of private value-added networks in France expensive.

The decrees were meant to set the stage for parliamentary debate on pending legislation aimed at deregulating the country's telecommunications markets. The PTT Minister, Gerard Longuet, promised to set liberalization in motion with decrees opening up markets for cellular telephone services and public pay phones.

But PTT officials said privately this week that the controversial legislation is unlikely to be debated by Parliament in this election year, meaning that last week's value-added network decrees may well be the only concrete outcome of Longuet's push to deregulate.

"There is no chance that it will be discussed. In an election period, no one wants to raise the anger of the unions," said a PTT insider. ◪

▶ *INTEGRATED SERVICES DIGITAL NETWORK*

Chevron in first test of Primary Rate Interface

BY MARY PETROSKY
West Coast Correspondent

CONCORD, Calif. — Chevron Corp. last week acknowledged that it will participate in what Pacific Bell and Northern Telecom, Inc. called the first user test of ISDN's Primary Rate Interface.

Pacific Bell and Northern Telecom — the vendors coordinating the project — announced plans for the Integrated Services Digital Network Primary Rate Interface test at the Tele-Communications Association's (TCA) 25th Annual Conference and Exhibition in San Diego. But the two companies declined to release the name of the user that will participate in the test.

Network World has learned that Chevron will begin testing ISDN Basic Rate Interface access at its facility here in the first quarter of 1988 and will move to primary rate access in the second quarter. Chevron currently has a Northern Telecom Meridian SL-1 in its Concord location that will be modified by Northern Telecom to support the necessary ISDN interfaces, according to William Houghton, general manager of communications technology at Chevron.

The SL-1 will be linked to a Northern Telecom DMS-100 that Pacific Bell has set up at its San Ramon, Calif., central office. Northern Telecom will upgrade the DMS-100 and play an ongoing role in the testing.

The Primary Rate Interface is designed to link a telephone company's central office equipment with devices such as a private branch exchange. It is divided into 24 channels: 23 B channels, capable of carrying voice or data, and one D channel, which carries signaling information controlling the B channels. The Basic Rate Interface features 2 B channels and one D channel.

One of the test's primary goals will be to evaluate the interworking of the SL-1 with the DMS-100, according to a Pacific Bell spokesman.

The Primary Rate Interface essentially establishes a peer-to-peer level of interworking between a user's PBX and the public network, the spokesman added.

Pacific Bell and Northern Telecom are evaluating a number of services for testing, including the ability to identify the telephone number of the calling party and the ability of the network to determine the type of call being made and choose the least costly route.

Other applications, such as personal computer-to-personal computer communications and personal computer-to-host data transfer will also likely be tested.

Chevron has a "long shopping

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▶ *LONG DISTANCE*

MCI, AT&T unveil services

BY MARY LINEHAN
Staff Writer

SAN DIEGO — MCI Communications Corp. announced plans at the Tele-Communications Association (TCA) conference here last week to offer expanded international direct dialing and operator services early next year. AT&T also used the conference to reveal plans to offer Accunet Digital Services between the U.S. and Japan beginning in 1989.

MCI said that, in the first quarter of 1988, its customers will be able to dial directly any location in the world where AT&T currently offers direct dial service.

Direct dial access will be available to users of MCI's Dial 1 long-distance service, its Prism services and its VNET virtual private network service.

According to a spokesman, MCI will be "the sole long-distance company able to offer international direct dialing from a virtual private network."

Initially, MCI's operator services will be offered only for users of the MCI Card travel card. Users will be able to make travel card calls from push-button or rotary dial telephones in the U.S. Today, travel card calls are only possible from a push-button phone. The carrier said it will offer other operator services, such as collect calling and operator assistance, by the end of the year.

Company officials labeled the operator services as a $4 billion-a-year market.

"This certainly enhances MCI's credibility as a long-distance provider," said Chris Jackson, a senior analyst in consumer communications at The Yankee Group in Boston.

"Realistically speaking, they are never going to become an AT&T as long as they have to rely on AT&T to route a lot of their domestic traffic," according to Jackson.

"But this enhances MCI's position among the second-tier companies," Jackson added.

AT&T said the International Accunet Digital Services will use a fiber-optic cable route stretching 7,200 miles across the Pacific from California to Hawaii and Japan.

The services, all scheduled to be available in early 1989, offer transmission speeds of 56K bit/sec, 64K bit/sec and 1.544M bit/sec, according to a company spokesman. The 64K bit/sec service will be offered with clear-channel capability.

The digital services will be provided by AT&T in cooperation with Kokusai Denshin Denwa Co. (KDD), Japan's international communications carrier.

AT&T's International Accunet Digital Services are an expansion of its existing family of Accunet digital service offered domestically and from the U.S. to the UK and France.

The services are available from major geographic locations known as gateways. Gateways for transpacific services are San Francisco, Los Angeles and New York.

According to AT&T, San Francisco and Los Angeles will also be added as West Coast gateways to the carrier's current transatlantic link. Other gateways on the Atlantic link are New York and Washington, D.C.

Customers would have the option of leasing the International Accunet Digital Services either on a monthly basis or for three- to five-year terms. Users will earn a 5% discount for a three-year contract and a 10% discount for a five-year contract.

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AYDIN MONITOR Systems

▶ *ACCESS CHARGE FLAP*

Foes of FCC plan cry foul

Vendors, users flood agency with complaints.

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — The Federal Communications Commission has received an avalanche of comments from telecommunications users and vendors opposing the agency's plan to impose access charges on packet network providers.

Enhanced service providers and their customers flooded the FCC with more than 100 legal filings and 5,000 letters by the Sept. 24 deadline for public comment — a near-record number of responses to an FCC proposal. Private nets may also be affected under the plan ("Private nets vulnerable in FCC access charge plan," *NW*, Sept. 28).

While it is not certain what effect this barrage will have on the policy, there is widespread speculation here that the Jan. 1 implementation date will be extended by at least six months, although the FCC has not issued an official statement to that effect.

Information service providers say the FCC access charge plan will dramatically increase their cost to provide on-line data bases, electronic mail and value-added network services. Users worry that the cost of such information services will skyrocket as a result of the FCC plan.

Business and residential users of on-line services mobilized their forces in an attempt to defeat the FCC plan and sent letters to their congressmen. House of Representatives Telecommunications Subcommittee Chairman Edward Markey (D-Mass.) was scheduled to hold a hearing last Friday to air user and industry concerns on the access charge issue.

Even companies that support the FCC's objectives found major deficiencies in the commission's proposal. Commenters such as Bell Atlantic Corp. and Pacific Telesis Group cautioned the FCC to take a slow, phased-in approach to implementing access fees to prevent "rate-shock."

Federal agencies such as the General Services Administration (GSA) and National Telecommunications and Information Administration (NTIA) rejected the FCC plan outright. The GSA said the plan could cause "irreparable harm to an industry on which the federal government increasingly relies for essential services."

Alfred Sikes, assistant secretary for the Department of Commerce and NTIA director, said, "Customer rates for information services will increase by about 300%." In its filing, NTIA said the FCC proposal could harm the "developing information infrastructure" on which the U.S. economy is based and could weaken the nation's international trade position.

Officials of Apple Computer, Inc. agreed with NTIA's assessment, warning, "At a time when other nations are positioning themselves to maximize their roles in the worldwide information economy, the commission's proposal is weakening our competitive stance."

The controversy over access charges arose in June when the FCC proposed eliminating the 1983 access charge exemption for enhanced service providers. When the exemption was imposed, the agency deemed the information service industry in its infancy and unable to shoulder the cost of access charges. Long-distance carriers and service resellers are now the only companies required under FCC rules to pay access charges to local exchange carriers. Access charges allow local exchange carriers to recover the cost of switching long-distance calls over their local networks.

The FCC has concluded that all users of the local exchange, including carriers, information service providers and end users, should contribute equally to the cost of operating intraexchange networks.

The Ad Hoc Telecommunications Users Committee said enhanced service providers are already paying their share of the cost of local access. The FCC also incorrectly assumes that the information service industry "has matured to the point where it can now weather the dramatic cost increases the proposed ruling would produce," the group's filing stated.

The Ad Hoc Committee said the FCC plan "lacks any analysis of the effects the proposal would have on consumers, network efficiency, local telephone companies, local ratepayers and the economy."

Tymnet/McDonnell Douglas Network Systems Co. said its local access costs will soar from $3.8 million a year to $69 million if the FCC plan is enacted. Chilton Corp., a credit reporting company, said its telecommunications costs will increase by $5.8 million annually, resulting in a 25% increase in the price of its services.

In its filing, the Association for Systems Management (ASM), representing 8,000 information systems analysts and consultants, said the FCC proposal would "increase local communications access costs tenfold. These costs, which will be passed on to users, for all practical purposes represent an information penalty charge," said David Sturtevant, ASM director.

Enhanced service providers will go from paying a $6-per-line subscriber line charge to a $25 surcharge for both originating and terminating lines, ASM predicted.

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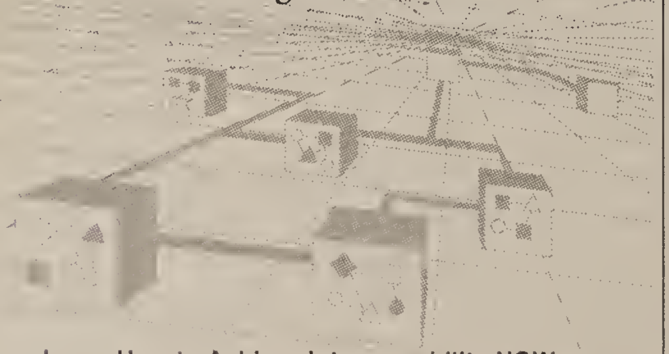

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Ten vendors join demo

continued from page 2

downstairs to tell the other operators what to do," he said. "You must have a basic philosophy of centralized control. It's geared to that kind of operation."

Vendors participating in the demonstration agreed that their current NetView/PC interfaces represent only an early step toward using NetView to centralize network management. They said they are working on sophisticated interfaces to allow downloading of configuration and control commands from NetView.

But vendors also said NetView itself must evolve before they can provide those interactive capabilities. "There has to be a better set of commands than what's available with NetView," said Gary Patterson, director of communications product marketing at Paradyne. "As NetView evolves, it'll be easier to provide more capabilities."

In general, product managers said they see their proprietary systems retaining control of physical network management, regardless of the depth of the NetView interface, and NetView evolving to reign over system resource management and logical session management.

The next versions expected, NetView Release 2 and NetView/PC 1.1, are scheduled for release in December and promise some of the advances needed. Most of the NetView/PC interfaces highlighted at the show will be available as software options with the proprietary net management systems, at prices from $1,000 to $4,000.

Tymnet switch bows

continued from page 2

a local host computer supported by another port, thus bypassing the network.

Configuration commands can be downline loaded to a Nano Engine from Tymnet's Network Control Center, a network management and control service. Each engine will monitor itself and supply status reports about network and data terminal equipment links to that Network Control Center via a diagnostic port.

The new switch, priced at $8,000, could open some doors for Tymnet at the low end of the market, according to Kathryn Korostoff, a market analyst with Framingham, Mass.-based International Data Corp. "Tymnet is still competing against Telenet and BBN Communications Corp. to build very large private networks. It has not competed against companies like Memotec Data, Inc., Dynatech Packet Technology, Inc. and Amnet, Inc., which target the low-end packet-switching users," she said.

"This could help them go after users who want to build private networks but don't want to spend $1 million to do it," she said.

The new CPU III, which combines CPU and read-only memory I/O access functions on the same board, resides in an existing Tymnet engine and increases throughput by 20%. When coupled with Tymnet's recently introduced MAC III Engine Accelerator Kit, throughput of existing Tymnet engines can be doubled.

Under an OEM agreement, Tymnet will sell Republic Telecom's RLX-8 and RLX-40 Private Line Expanders under its own MD 7008 and MD 7040 Private Line Expander private label.

The MD 7008 enables up to eight voice or data channels to share one 56K bit/sec digital data service link or single DS0 channel in a T-1 pipe. The MD 7040 combines up to 40 voice or data channels onto four 56K bit/sec or DS0 digital links.

"Packet-switching vendors seem to be making an effort to incorporate voice technology into their networks," Korostoff said.

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STRATEGIC SLASHING

Mitel pares its PBX prices

BY BOB WALLACE
Senior Editor

SAN DIEGO — Mitel Corp. last week cut the prices of its low-end and mid-range private branch exchanges by an average of 20% in an effort to stave off competitors in the under-500-line PBX market.

The cost cuts, announced at the Tele-Communications Association's 25th Annual Conference and Exhibition here, were prompted, at least in part, by declining sales of the company's smaller analog and digital switches, according to Tom Mayer, executive president for Mitel.

Effective immediately, the price reductions will apply to entry-level configurations of Mitel's SX-20, SX-50 and SX-200 analog and digital switches. The vendor would not specify the size of an entry-level PBX configuration.

Mitel's high-end PBXs, the SX-2000S and the SX-2000SG, are reportedly not part of the price-reduction plan.

Flagging sales

Mayer said sales of Mitel's low-end, under-100-line switches are flagging. This market segment has long been dominated by Mitel.

"Our share of market in that segment has declined," he said.

Mitel, which sells its gear mostly through dealers and supply houses, is currently exploring new channels of distribution. "We are looking at the advantages of selling direct to users," Mayer said.

Mitel already sells directly to the federal government and has a national accounts group to sell to major accounts.

Mitel Qualified Dealers and supply houses, such as North Supply Co., applauded the sweeping price reductions.

A positive move

Charles DeAngelo, president of American Telephone Distributors, Inc., a Mitel Qualified Dealer based in Kansas City, Mo., said, "I view this price reduction plan as a very positive move on Mitel's part.

"This will allow Mitel switches to stay competitive with similar-sized switches made by other vendors," he continued. "This move represents the largest commitment Mitel has made to selling its products in years."

Terry Bryan, vice-president and general manager for North Supply's business systems division, added, "These price cuts will definitely serve to boost sales of these switches."

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MCI, AT&T unveil

continued from page 5

Prices for transpacific service, without discounts for multiple circuits or long-term contracts, will range from $6,500 to $100,000, depending on the gateway and transmission speed.

Prices on the Atlantic link range from $4,000 to $82,000.

As an example, 56K bit/sec service between New York and Japan is priced at $12,000 a month. Transpacific service at 1.5M bit/sec from either San Francisco or Los Angeles will cost $60,000 a month. Similar service from New York will cost $100,000 monthly.

According to AT&T, several customers have already contracted for Pacific link services. Initial customers include American Airlines, Inc., Garban Computer Services, Inc., J.P. Morgan & Co., Inc., Nomura Securities Co.,. Ltd. and PARS Service Partnership.

INDUSTRY UPDATE

> There was nothing special about the way Charlie Brown said, 'Can you step over to my office for a moment?' He sat behind his desk, coatless as usual, sleeves rolled up, to all appearances at ease. Yet, on this December day six years ago, Charlie had made a decision that would affect the life of every American. 'I'm prepared to recommend to the board of directors,' he said, 'that we accept the government's terms to end the antitrust case.' . . . The solution he had chosen seemed so draconian, so final. His words were like acid in my gut.
>
> **Edward M. Block**
> Retired senior vice-president of AT&T
> From an article entitled, "Last Call," *New York Times*, Sept. 20.

INDUSTRY EYE

PAM POWERS

Notes from the underground

Perusing the possibilities. As the dust settles in the wake of Data Switch Corp.'s merger with T-Bar, Inc., Data Switch is once again beginning the long and careful process of evaluating other potential candidates for a joint venture or acquisition.

One of those is Cambridge, Mass.-based BBN Corp., a front-runner in the packet-switching arena. Data Switch President Robert Gilbertson said his talks with BBN are at this point only in the speculative stage and that the company is looking at other vendors as well. Gilbertson said he wants to make sure everything is running smoothly with combined T-Bar/Data Switch operations before striking out on another venture.

The perfect suitor. Meanwhile, BBN is apparently considered an attractive partner by several other companies. Memotec Data, Inc. President William McKenzie has expressed, in passing, interest in forming a liaison with the company, and rumors of other BBN partnerships abound. Amidst this swirl of flirts, BBN is working on integrating its packet switch with Network Switching Systems, Inc.'s T-1 multiplexer.

Reassembling the support system. NCR Comten, Inc.'s decision to stop selling Telematics International, Inc.'s packet-switching equipment probably didn't have much to do with the equipment itself.

A user, seemingly one of only three packet accounts Comten managed to land, told *Network World* he is very impressed with the Telematics gear. In fact, he said he is happier with the new arrangement, under which he receives support directly from Telematics. In the past, he had to work through Comten to get answers from Telematics, which he considered to be an inefficient system.

However, Telematics has traditionally aimed for selling its equipment through systems integrators and other third-party channels, and the company may not yet be primed to support end users directly. Sensing that problems may develop, other packet vendors such as M/A Com, Inc. are seeking ex-Comten users in hopes of picking up the business.

The global perspective. Over the past year, the communications industry has become increasingly global in perspective, with domestic vendors attempting to penetrate international markets and forming marketing relationships with foreign companies. The reasons for this include sagging domestic demand for products, increased competition from outside the U.S. and the sliding dollar.

Just in the past couple of weeks, AT&T Ricoh Co., a joint venture between AT&T and Ricoh Corp., decided to manufacture and market AT&T's Merlin phone systems in Japan. EDS Communications Co. created a joint venture with the Spanish Postal Telephone and Telegraph to sell its packet-switching equipment. And Communications Solutions, Inc. closed deals with three European vendors totaling in excess of $1.5 million. Companies in Rome, Milan, Italy and Herlev, Denmark, will license CSI's Access/SNA software.

ANALYSIS

Bold buyout strategy clicks for Memotec

Data gear vendor succeeding via acquisitions.

BY PAM POWERS
Senior Editor

MONTREAL — Memotec Data, Inc.'s plan to grow through carefully chosen acquisitions and strategic alliances with other vendors has catapulted the once-small vendor of packet-switching equipment to new heights as a highly profitable company with a widening product line.

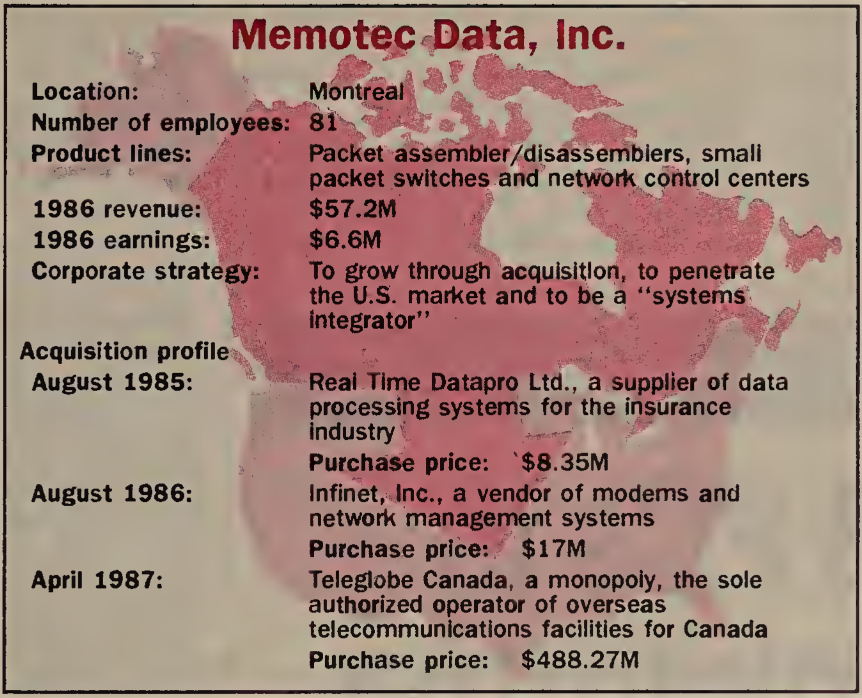
The data communications equipment company's acquisition activity has also drawn the interest of investors and investigators. Last week, seven people, including three members of Memotec's board of directors and a prominent Montreal lawyer, were charged with insider trading. The charges stemmed from stock transactions prior to Memotec's acquisition of Teleglobe Canada.

The Quebec Securities Commission said those charged purchased Memotec shares on advance information that revealed the company was about to acquire Teleglobe, the Canadian monopoly for international data communications transmission services.

Memotec President William McKenzie said the company reported to the commission unusual changes in the price of Memotec stock during negotiations for Teleglobe.

In November 1986, the Canadian government decided to sell its ownership in Teleglobe. Memotec was

See page 10



Memotec Data, Inc.

Location:	Montreal
Number of employees:	81
Product lines:	Packet assembler/disassemblers, small packet switches and network control centers
1986 revenue:	$57.2M
1986 earnings:	$6.6M
Corporate strategy:	To grow through acquisition, to penetrate the U.S. market and to be a "systems integrator"
Acquisition profile	
August 1985:	Real Time Datapro Ltd., a supplier of data processing systems for the insurance industry **Purchase price:** $8.35M
August 1986:	Infinet, Inc., a vendor of modems and network management systems **Purchase price:** $17M
April 1987:	Teleglobe Canada, a monopoly, the sole authorized operator of overseas telecommunications facilities for Canada **Purchase price:** $488.27M

INTERNATIONAL

Japan approves group's bid

BY JOSH GONZE
Staff Writer

TOKYO — Transpacific telecommunications service rates may fall as a result of the Japanese government's recent decision to allow entry into its telephone market to a vendor consortium that includes the UK's Cable & Wireless p.l.c.

After months of pressure from the U.S. and UK governments, Japan's Ministry of Post and Telecommunications announced it would invite the consortium, known as International Digital Communications, to apply for licensing. In Japan, such an invitation usually means the request for licensing will be granted, according to Joseph Crouch, director of subsidiary Cable & Wireless North America, Inc.

The concession by Japan's government follows the failure in August of a merger it proposed between International Digital Communications and an all-Japanese consortium that was also vying for a transpacific license. That consortium is now expected to receive its own license, according to published reports.

Crouch said International Digital Communications will use its license to compete with Kokusai Denshin Denwa Co., the current Japanese monopoly, by offering users higher quality international circuits at lower prices. Initially, the consortium will tailor its services for corporate users. "It will probably give priority in the early stages to business customers; but in the longer term, it will address consumers as well," Crouch said.

Pacific Telesis Group is slated to hold a 10% stake in International Digital Communications, but regulatory obstacles may prevent the regional Bell holding company from participating in the consortium. According to the 1984 consent decree, former AT&T units are not allowed to offer long-distance services. Pacific Telesis will request a waiver from U.S. District Court Judge Harold Greene and has asked the Department of Justice for permission to hold the option until a decision on the waiver is made, a spokeswoman said.

American-owned Merrill Lynch & Co., Inc. has a 2.5% share in the consortium.

The consortium plans to lay fiber-optic cable from Japan to Alaska, with a spur terminating near Seattle, Crouch said.

BRIEFS

Shareholders of both **3Com Corp.** and **Bridge Communications, Inc.** last week approved the merger of the two companies, after which Bridge stock was withdrawn and the company formally became part of the surviving 3Com.

Even without Bridge's additional revenue, which reportedly will make 3Com the world's largest independent local networking vendor, the latter had another highly profitable quarter. For its fiscal first quarter 1988, ended May 31, 3Com posted earnings of $3.6 million on revenue of $33.1 million. That represents a 90% increase in earnings and a 65% increase in sales as compared with the first quarter of 1987.

XMIT AG, a Swiss manufacturer of synchronous packet assembler/disassemblers that are marketed primarily in Europe, signed an OEM agreement with Dynatech Packet Technology, Inc., maker of asynchronous PADs and other data communications products. Dynatech will sell and maintain XMIT's PADs domestically and abroad. The pact reflects the growing user interest in running synchronous communications protocols over private and public packet networks.

US West, Inc. announced plans to sell part of its NewVector Group, Inc. subsidiary, which sells cellular telephones. The regional Bell holding company put up for sale 8.4 million shares of NewVector stock, which is expected to sell for $20 to $23 a share.

NewVector intends to use the money to develop new cellular and paging systems and to acquire similar companies, among other projects. Upon the completion of the sale, US West will hold about 80% of NewVector.

Communications Satellite Corp. appointed a president and two new members to its board of directors. Irving Goldstein, chairman and chief executive officer, will assume the additional post of president of COMSAT. Lucy Wilson Benson, a director on several corporate boards, and Peter Likins, president of Lehigh University, were elected to the COMSAT board to fill vacancies resulting from the resignations of Marcel P. Joseph and John Sculley.

A U.S. district court handed **Richard Colino,** former director general of International Telecommunications Satellite Organization, a six-year prison term for fraud and conspiracy.

The decision marks the culmination of a massive diversion of INTELSAT funds, amounting to more than $5 million, that reportedly lined the pockets of Colino and two real estate brokers involved in the scheme.

The court also ruled that Colino must pay back the diverted $865,000 that can be traced to his bank accounts. INTELSAT contends that Colino received far more of the satellite consortium's funds before he was discovered.

Bold strategy clicks for Memotec

continued from page 9

a lilliputian among a number of corporate giants bidding for the company, so McKenzie said it came as a great surprise when his company won the bidding. He said Memotec won the acquisition because it offered the highest bid.

The government has mandated that Teleglobe be allowed to retain its monopoly status for another five years, and, with Canada's international traffic growing at roughly 24% annually, McKenzie said he feels he has made a sound investment, despite Teleglobe's hefty price tag of $488 million and the controversy now swirling around the acquisition.

Since its early days as a low-profile vendor of packet assembler/disassemblers, with modest revenue of $3.2 million in 1983, Memotec has grown by leaps and bounds as a result of its strategy of expanding through alliances and acquisitions. At year-end 1986, the company had amassed $6.6 million in earnings on revenue of $57.2 million. Those figures will balloon again this year due to the purchase of Teleglobe, which McKenzie described as being "incredibly profitable." Teleglobe's operating profit for 1987 is estimated at $96.5 million.

Teleglobe is the most recent in a string of Memotec acquisitions that began with the purchase in 1985 of Real Time Datapro Ltd., a Canadian vendor of data processing systems for the insurance industry. McKenzie said the operation has provided Memotec with experience in operating in a vertical market and has doubled in size since the acquisition.

> Perhaps Memotec's most lucrative relationship is destined to be the one it now has with AT&T. McKenzie said Memotec has jointly bid some private packet-switching networks with the carrier.

Last year, McKenzie accomplished his intended goal of increasing Memotec's presence in the U.S. communications market with the acquisition of Infinet, Inc., a N. Andover, Mass.-based manufacturer of modems and network management systems. The companies spent the past year integrating their product lines, so that now Infinet's network management systems can control Memotec PADs. "[Infinet] provided instant identity and distribution channels for us [in the U.S.]," McKenzie said. "They have 35 salespeople to our 10." He added that the Infinet sales force is now actively selling Memotec products.

Infinet has also provided Memotec with a set of ready-made liaisons with other vendors. Infinet has OEM agreements with Infotron Systems Corp. and Digital Communications Associates, Inc. Memotec has its own relationships; the company sells its equipment through Computer Sciences Corp., Northern Telecom, Inc. and Harris Corp., among others. "Part of our strategy is to sell through multiple distribution channels," McKenzie said. "We rely on other companies and their customers, too."

Perhaps Memotec's most lucrative relationship is destined to be the one it now has with AT&T. McKenzie said Memotec supplies AT&T equipment for its Accunet public packet network and has jointly bid some private packet-switching networks with the carrier. Additionally, in conjunction with Harris, which acts as prime contractor, Memotec is involved in the development of AT&T's Skynet Data Service, a very small aperture terminal satellite service that McKenzie predicted will be "very big. It will be very cost-competitive with terrestrial networks."

Much as his competitors do, McKenzie thinks expanding Memotec's product line and services is critical to the company's future success. "Our philosophy is changing. We are still selling individual units, but we're trying to position Memotec as a networking company. This has become a systems integration business," McKenzie said. Memotec's role in systems integration, he said, will be to act as a subcontractor in large network bids by furnishing consulting services and software to tie together multivendor equipment.

Kathryn Korostoff, a senior analyst with International Data Corp. in Framingham, Mass., commented that, as one of the most profitable companies in the packet-switching market, "Memotec's diversified distribution strategy seems to be working well for the company." She applauded McKenzie's efforts to break out of the traditional low-end PAD business and move toward systems integration.

McKenzie admitted his ambitious plans for Memotec will take some work. The company is still a relative unknown in the U.S., he acknowledged, and its Achilles' heel is a general lack of marketing prowess. "We have to get better at selling, at proving our reliability," he said.

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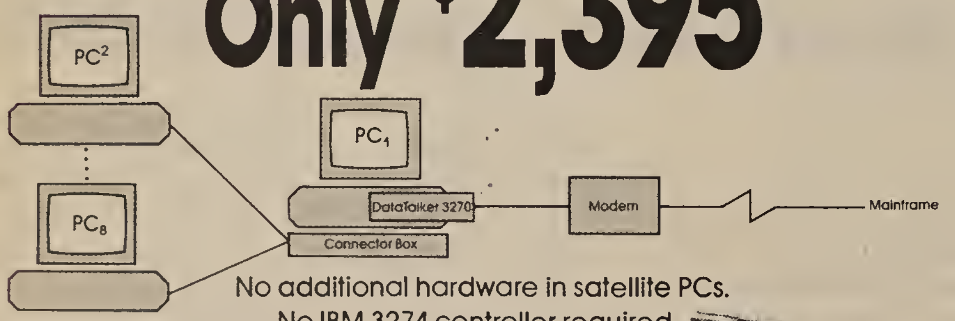

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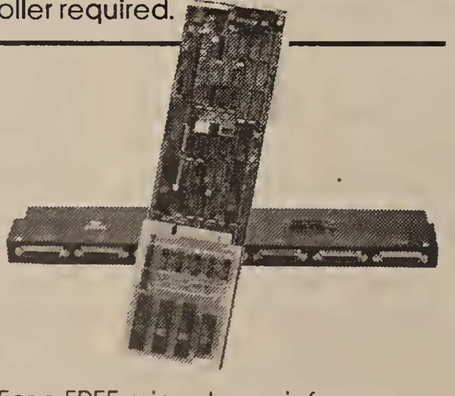

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TELECOM TRENDS

Long-distance dollars

A recent survey revealed that, while federal government installations have the largest number of telephones per site, an average of 242, they are among the most frugal in their use of long-distance services.

The survey, performed by West Hartford, Conn.-based Focus Research Systems, a company of Dun & Bradstreet Corp., found the average government site's monthly long-distance bill was less than $50. The survey was conducted over a 12-month period.

NETWORK UPGRADE

User comes under the gun

Miami SWAT team crashes in on bank's net technicians.

BY BOB WALLACE
Senior Editor

MIAMI — It's not unusual for a communications manager and other staff members to draw fire from end users during a major network upgrade. But network technicians at Southeast Bank, N.A. here almost came under fire, literally, during one phase of a network project currently under way.

After having hoisted a huge, two-cabinet Northern Telecom, Inc. SL-1NT to the roof by crane, the technicians were installing the new private branch exchange in a switch room atop the bank's six-story Miami Springs facility here.

Unbeknownst to them, a Miami police Special Weapons and Tactics (SWAT) team was scaling the building. The activity on the bank's rooftop had attracted the attention of a police helicopter, which was patrolling the city during the recent visit of Pope John Paul II, and the SWAT team was called into action. SWAT team members kicked in the switchroom door and leveled their automatic weapons at the technicians.

According to Alba Shumate, telecommunications services vice-president for the bank, the situation was quickly cleared up, leaving the technicians shaken but unharmed. "I am very happy we have strong police support in this city," joked Shumate, who is overseeing Southeast Bank's network project.

Hauling the PBX up to the rooftop switch room was itself, in Shumate's words, "a very hair-raising process. We have frequent rain showers here, and I was afraid the switch would be drenched while it was being hauled up to the roof," she said. But the rains never came.

Shumate said the network upgrade, which has been otherwise uneventful, is the fruit of a joint marketing effort undertaken by Southern Bell Telephone and Telegraph Co., which handles the bank's local telephone service in some areas and provides digital Centrex service to other branch offices, and Southern Bell Advanced Systems, Inc. Southern Bell Advanced Systems is providing the bank with Northern Telecom SL-1 PBXs and NEC America, Inc. key telephone systems.

"In the past, we could only order services from Southern Bell," Shumate recalled. "Now, under the joint marketing arrangement, the two parties were able to offer a single network proposal including equipment and services."

On Aug. 4, the bank began replacing AT&T and GTE Corp. PBXs and key systems at major locations linked to its current voice net backbone. The backbone has three nodes — here, in Orlando and in Tampa — that are already equipped with Northern Telecom SL-1s. The nodes are linked via private lines in a triangular configuration. Roughly 200 sites are hooked to the current network.

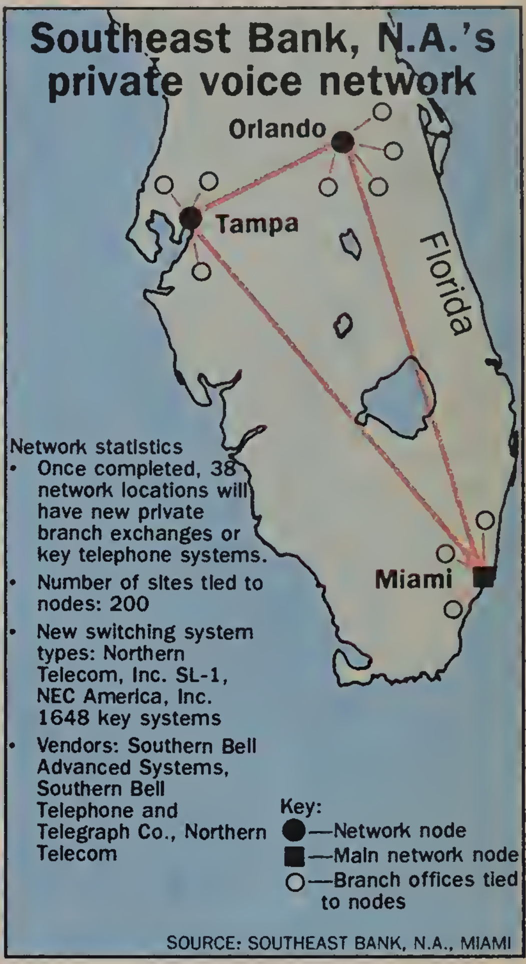
Thirteen major bank sites are being equipped with SL-1s and 25 others will get NEC key systems, according to Shumate. The key systems will be networked with the SL-1s.

The equipment replacements are expected to be completed by Oct. 23. Most of the locations getting new equipment will be completely rewired to avoid potential problems with inside wire.

Shumate said Southern Bell Telephone and Southern Bell Advanced Systems staffers have worked very well with the bank's own telecommunications staff, easing an arduous task. "Everybody who works on the project works as one team," she said. "They work very closely together and treat each other with a great deal of respect."

She said the bank's telecommunications staff takes pride in having created and maintained strong relationships with its major vendors.

"We hold weekly meetings with all our top vendors," she said. "If someone can't attend, we get them on the speakerphone."


Southeast Bank, N.A.'s private voice network

Network statistics
- Once completed, 38 network locations will have new private branch exchanges or key telephone systems.
- Number of sites tied to nodes: 200
- New switching system types: Northern Telecom, Inc. SL-1, NEC America, Inc. 1648 key systems
- Vendors: Southern Bell Advanced Systems, Southern Bell Telephone and Telegraph Co., Northern Telecom

SOURCE: SOUTHEAST BANK, N.A., MIAMI

CROSS TALK

BOB WALLACE

Account executives: key middlemen

A good account executive serves as an information conduit between user and vendor. A bad one can sour the relationship between the two.

Users rely on account representatives for product development information. In turn, they expect the account executive to relay their concerns, compliments and suggestions back to the vendor.

Users also want account executives to keep them abreast of developments involving the vendor — such as mergers, acquisitions and OEM arrangements — that could affect their companies. In addition, users look to their account executives for information about vendor-sponsored users groups.

Users want to maintain strong relationships with qualified account executives. Thus, turnover in the ranks of account executives hurts the user because it takes time for replacements to become familiar with the user, its telecommunications staff, its needs and the business it is in.

Alba Shumate, telecommunications services vice-president for Southeast Bank, N.A. in Miami, has high praise for the account executives from BellSouth Advanced Systems, Inc., Southern Bell Telephone and Telegraph Co., AT&T and GTE Corp., its primary vendors. She said the bank has worked with one Southern Bell account executive for five years. "She knows the bank inside and out, and that helps a great deal," Shumate said.

One telecommunications manager, who requested anonymity, operates a statewide voice network and said he was upset that his account executive had not kept him apprised of important users group meetings planned for this fall. This colored the user's impression of the vendor.

Account executives can avoid the wrath of their clients by informing them of planned product introductions, enhancements to current offerings, schedules for users group meetings and any internal vendor changes that are likely to become public knowledge. A user that hears of these developments from other sources may begin to believe the account executive is withholding this information, or worse, is not keeping up with it.

US SPRINT

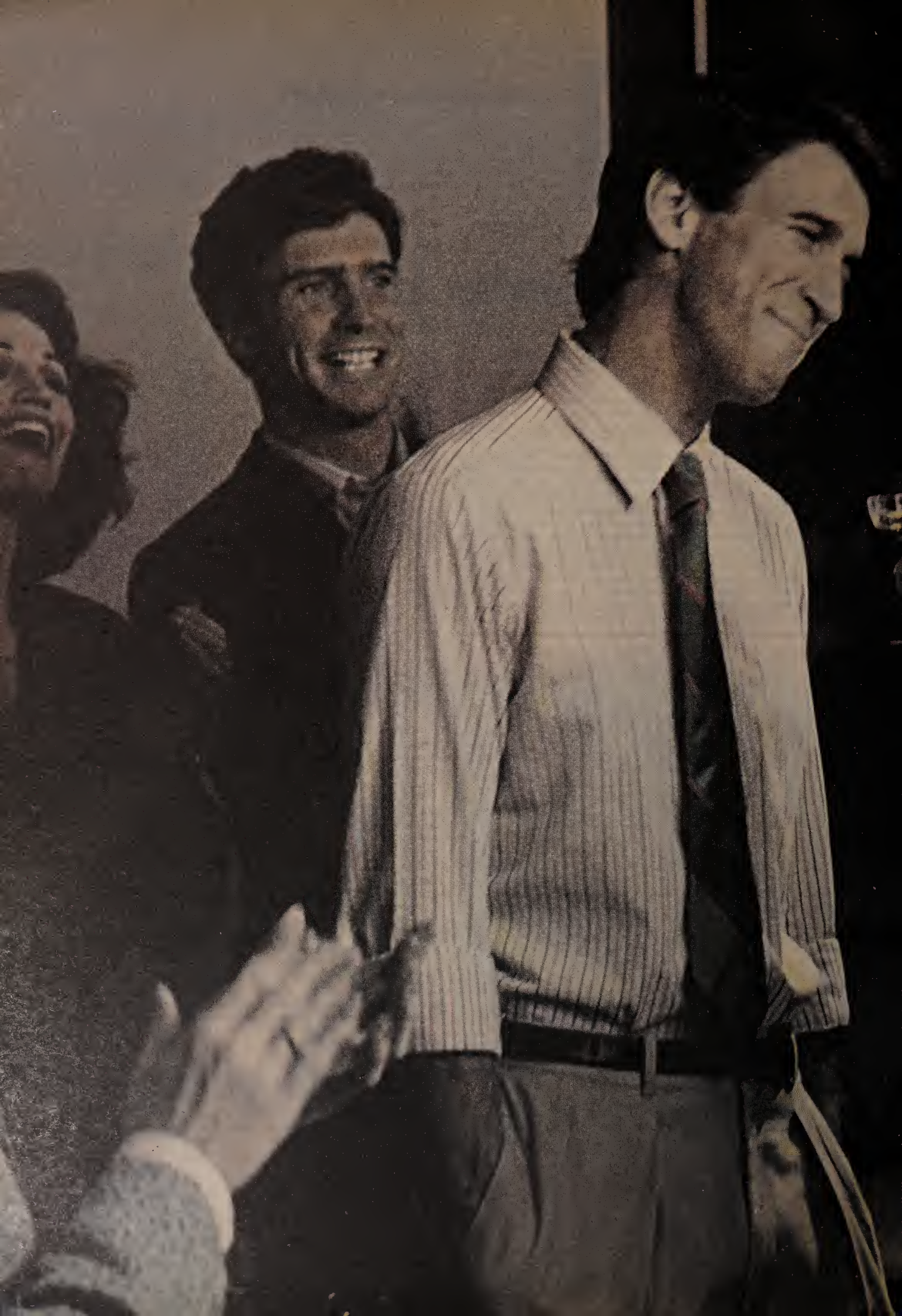
Reliance signs for VPN

CLEVELAND — Reliance Electric Co. last week signed on as the 175th customer of US Sprint Communications Co.'s Virtual Private Network (VPN) service.

Reliance, a maker of electric motors and drives and control equipment based here, placed an order for 850 VPN circuits in mid-September, according to Jim Conroy, director of MIS. The company currently uses a private tandem network to link 30 locations throughout the U.S. Conroy said Reliance will replace that network with a VPN using three dedicated T-1 circuits. He would not divulge the value of the contract or specific net configuration information.

Conroy said Reliance installed 10 VPN circuits in April as a trial. He said US Sprint "offered significant cost reductions and increased functionality for our users."

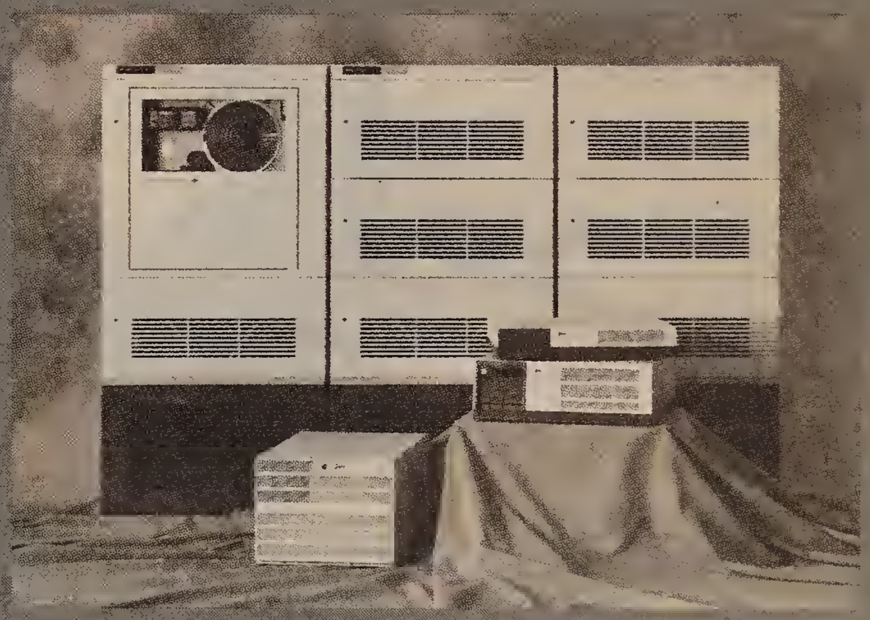
Using central office switch-based software, virtual network services offer the capabilities of private, leased-line networks.



"I'm told they don't throw many parties down in DP.

So I asked Doug to come up to ours. Doug's the real brains behind our new 3B system. He's the reason our computers can now talk to the IBM in Accounting and the DEC in Manufacturing. If you know anything about DP, that amounted to doing business across the Berlin Wall. Doug had a brainstorm and suggested AT&T. Their approach is standardizing communications between different systems. I don't have to tell you that's opened some doors around here. We owe Doug a lot.

AT&T comes through."



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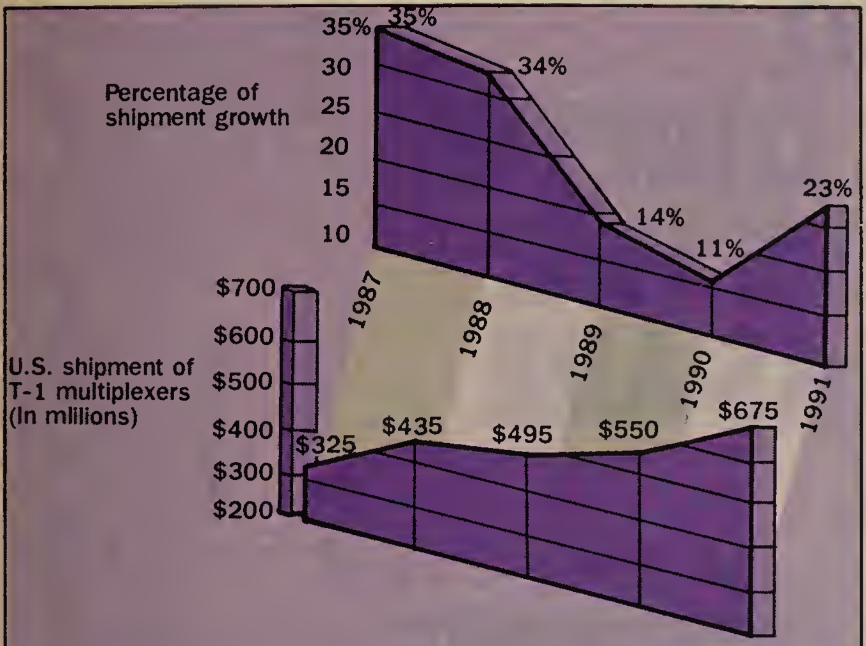
> “Users are demanding that vendors provide one-stop shopping for network equipment and the ability to manage their networks. Companies established in only one market are at a disadvantage in developing a complete network line and a comprehensive network management system.
>
> **From “Trends in the T-1 Multiplexer Market”**
> International Data Corp.
> Framingham, Mass.

T-1 mux market growth rate to slow



T-1 multiplexer sales will continue to rise during the next few years, but at an increasingly slower rate.

SOURCE: FORRESTER RESEARCH, INC., CAMBRIDGE, MASS.

MATRIX SWITCHING

Dynatech unwraps distributed switch

Also bolsters net management.

BY PAUL KORZENIOWSKI
Senior Editor

SAN DIEGO — Dynatech Data Systems last week moved to strengthen its position in the matrix switch market with the introduction of its first distributed matrix switch, an enhanced performance measurement system and a pledge to develop an integrated network management system.

Dynatech announced a new port bank, the I/O portion of a matrix switch, that enables its Configuration, Test and Monitor (CTM) line of matrix switches to support distributed data processing applications. The new port bank supports up to 320 RS-232 connections.

The port bank works with either fiber-optic or copper cable. Using fiber cable, a port bank can be located up to 1,000 ft from a matrix switch. With copper cable, the device can be placed 300 ft from a switch. A user can put a port bank on one floor of a building and link it to a matrix switch on another floor. Previously, a port bank had to be located on the same floor as the matrix switch. The new device will be available in the fourth quarter and is priced at $400 per port.

The company also enhanced Prism, a performance measurement system that tracks such items as terminal response time. The product now supplies performance alarms based on user-defined groups. For example, users can examine problems with a specific device such as a front-end processor; previously, they could only examine line problems. Current Prism users can upgrade to the latest release for $5,800.

Dynatech also added a modeling option to Prism. Modeling enables users to enter network configuration data and initiate tests to see how the network will perform. The Prism modeling tool performs three functions. Users can play what-if games with their networks. For example, they may see how the network would be affected if 4.8K bit/sec lines were replaced with 14.4K bit/sec lines.

The other two functions of the modeling option are trend and risk analysis. The modeling option costs

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DISTRIBUTION STRATEGIES

Racal-Milgo, DCA join in mux deal

Firm joins NTI, Infinet selling DCA T-1 gear.

BY PAUL KORZENIOWSKI
Senior Editor

Racal-Milgo, Inc. and Digital Communications Associates, Inc. (DCA) have forged a strategic alliance that helps both vendors fill missing pieces in their product lines and moves them closer to becoming full-service communications suppliers.

The OEM arrangement with DCA gives Racal-Milgo a high-end T-1 multiplexer while the company is at work developing its own mid-range offering. DCA, which signed two other major OEM agreements for its System 9000 T-1 multiplexer recently, gets yet another strong distribution channel for the product.

The Racal-Milgo/DCA alliance, sealed last month, initially calls for Racal-Milgo to sell the System 9000 and for the two companies to develop links between their respective network management systems. If the agreement bears fruit, analysts speculated that the two firms may further cross-pollinate each other's product lines.

Rick Villars, an industry analyst at International Data Corp., a market research firm in Framingham, Mass., said the companies' product lines are complementary. Racal-Milgo has a strong line of modems and a robust modem-based network management system. DCA's System 9000 is viewed as one of the industry's most technically elegant T-1 multiplexer products.

News of the agreement came in conjunction with Racal-Milgo's introduction of 14 new products prior to the Tele-Communications Association show held in San Diego last week. Among the 14 products, the company unveiled its first X.25 packet assembler/disassembler, plans to develop a mid-range T-1 multiplexer and enhancements to its network management system.

Matthew A. Kenney, president and chief operating officer of Racal-Milgo, said the firm is trying to become a one-stop communications supplier. He said the company is considering other strategic alliances, in addition to developing communications products.

For DCA, the pact is the third OEM

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DATA DIALOGUE

PAUL KORZENIOWSKI

Wielding slingshots against net management Goliaths

A head-to-head battle is brewing in the integrated network management market.

Since the introduction last May of NetView, its host-based net management system, IBM has been depicted as the integrated network management market leader. Last month, AT&T, which had been sitting on the sidelines, challenged IBM with the announcement of its Unified Network Management Architecture (UNMA). The blueprint will let users manage nine areas: fault isolation, performance, accounting, security, planning, operations, integrated control, configuration and custom requirements.

Other communications companies have stated their intentions to develop integrated net management systems and have tried to position their equipment as the central control point in a network. These vendors should think twice about that strategy.

The vendors said they will publish interfaces so other vendors can link their products to the central net management systems. The offers have met with little or no response, the most telling difference between these suppliers and the two industry giants.

Only companies with large market share can establish de facto industry standards. There are only two groups responsible for controlling most customer networks. One group comes from the data side of an organization and manages the network with host-based offerings, such as NetView. The other group grew up on the voice side and relied on carriers for net control.

A performance measurement tool supplements a primary network management system. Few Fortune 500 companies will hand over management of their networks to a performance management company, no matter how good its products are.

One reason is sheer size. Large customers usually feel most comfortable dealing with fellow Goliaths they know will stay in business.

Developing an integrated net man-

See page 18

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NETWORKING

Racal-Milgo, DCA join

continued from page 15

agreement forged in the last six months involving the System 9000. In September, the firm announced a marketing deal with Northern Telecom, Inc., and six months ago it signed a similar pact with Infinet, Inc.

Rick Malone, a principal at Vertical Systems, Inc., a Dedham, Mass., market research firm, said DCA is trying to take the T-1 multiplexer market by storm.

Malone said such a strategy may reap short-term benefits but could pose long-term problems. He views T-1 multiplexer sales as strategic efforts to gain account control. A T-1 multiplexer is often the pinnacle of a customer's communications architecture. Through OEM deals, DCA may be helping competitors grab the key element needed for account control.

Another problem for DCA may be distribution confusion, instances in which different companies try to sell a customer the same product.

Another concern is Racal-Milgo's commitment to selling System 9000s. The company said it plans to develop its own T-1 multiplexer, which will be announced at the beginning of next year. Kenney depicted that box as a mid-range system complementing DCA's high-end offering. But, in other OEM situations, vendors have paid lip service to the OEM product while waiting for their own to be developed.

If DCA and Racal-Milgo overcome the possible hurdles, analysts think the two firms will forge a closer relationship. Currently, DCA has an OEM agreement with Fujitsu America, Inc. for its modems. Analysts said those modems lack the diagnostic capabilities needed by many large companies. DCA could, possibly, sever its deal with Fujitsu and begin reselling Racal-Milgo modems. ☑

Wielding slingshots

continued from page 15

agement system requires deep pockets. IBM said its NetView development team is the single largest group within the company's huge Communication Products Division. Small companies will be hard-pressed to match the investment the giants make in net management.

Rather than trying to establish another de facto standard, communications firms should work to build a central network management system that controls their own equipment.

AT&T is following a three-tier net management design. At the top tier, the company will have a central system providing a global view of the net. On the second tier, packages will collect information from bottom-tier net management packages that control specific devices. The second-tier packages funnel that information to the central point.

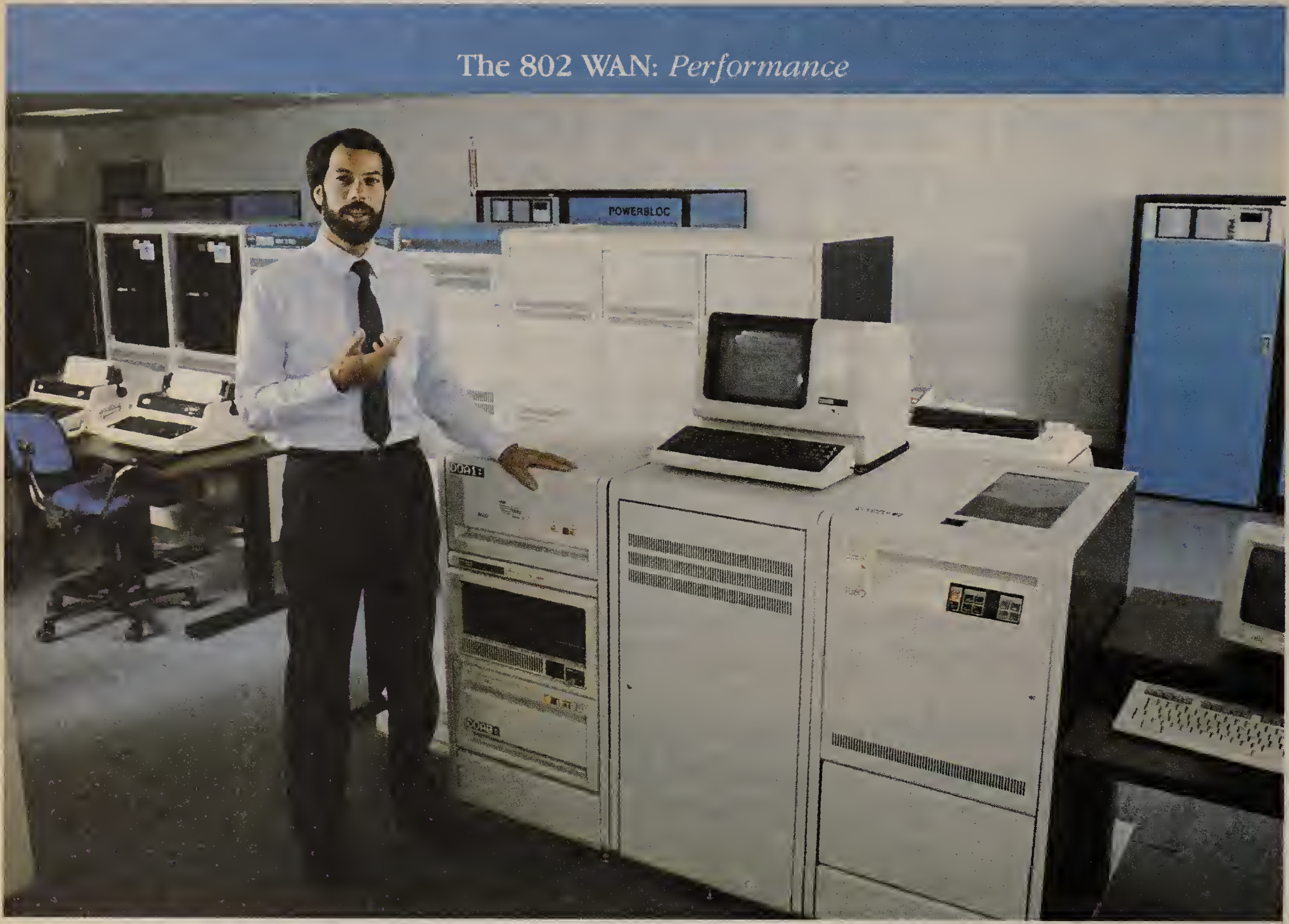
By linking their control systems, communications suppliers can provide second-tier integration. That approach would increase net management sales without butting heads with IBM and AT&T. ☑

Dynatech unwraps

continued from page 15

$20,000 and is available.

Dynatech unveiled a plan to integrate its separate network management systems into a central system. The first release of the central system, DynaNet 210, will control Dynatech matrix switches and support Prism. The company plans to integrate DynaNet 210 with network management systems used with the company's line of IBM mainframe channel extenders and the Accumux, a T-1 multiplexer from a subsidiary, Dynatech Communications, Inc. The net management product, to be available in the fourth quarter, costs $25,000. ☑



"WE USED TO TRANSFER MULTIMEGABYTE FILES BETWEEN SITES VIA 'SNEAKERNET.' NOW WE USE TransLAN."

—*Jack Covert,* Head, Technical Services, Hughes Aircraft Company

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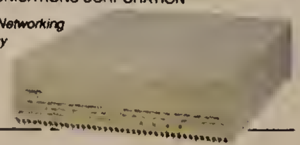

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LOCAL NETWORKING

> “The realization that TCP/IP and Ethernet are standards is no revelation.
>
> **Doug Gold**
> Senior analyst
> International Data Corp.
> Commenting on the recent spate of Ethernet and TCP/IP support announcements from vendors selling proprietary networking products.

LAN STRATEGY

Hughes takes flight with united Ethernets

BY PAULA MUSICH
Senior Editor

LONG BEACH, Calif. — About 2½ years ago, GM Hughes Electronics started interconnecting local networks at a few of its sites around Southern California to allow them to communicate. Now, Hughes — which at the time was known as Hughes Aircraft Co. — has what its network engineers believe is the largest Ethernet installation in the world.

A liberal corporate policy toward local net acquisition, based on the belief that a unified system would allow Hughes to be more competitive, was coupled with a decentralized acquisition process, in which departments were free to purchase their own local nets. Together, this fueled the rapid growth of the installation, which now supports more than 10,000 users at 700 sites.

“Hughes made an internal decision to create a corporate CAD program to make us competitive in the industry for producing [very large-scale integration] chips,” said Jack Covert, the head of technical support services for Hughes’ corporate VLSI support organization.

Different VLSI design centers within the company that were responsible for producing these chips were virtually independent companies responsible for their own profit and loss — they even occasionally competed with one another for contracts. “Instead of each one of these groups running off and doing their own thing, the company realized that it needed a unified system to exchange information between centers,” Covert said. “It gave us the charter to come up with the most cost-effective and reliable means of doing it. Because most VLSI sites had DEC VAX machines with Ethernet connections, it seemed that if we could connect the Ethernets, we could do the job very efficiently.”

Connecting the Ethernets at the VLSI centers required high-speed links, such as T-1 links, because the centers needed to transfer large, multimegabyte VLSI design files to high-powered, specialized computers. Those computers then ran simulations on the files for fault and logic evaluation. Once the simulations were run, the designs were transferred to a Hughes foundry for producing the chips. Prior to the high-speed links, engineers drove tapes between centers and the foundry, resulting in trips that sometimes took hours.

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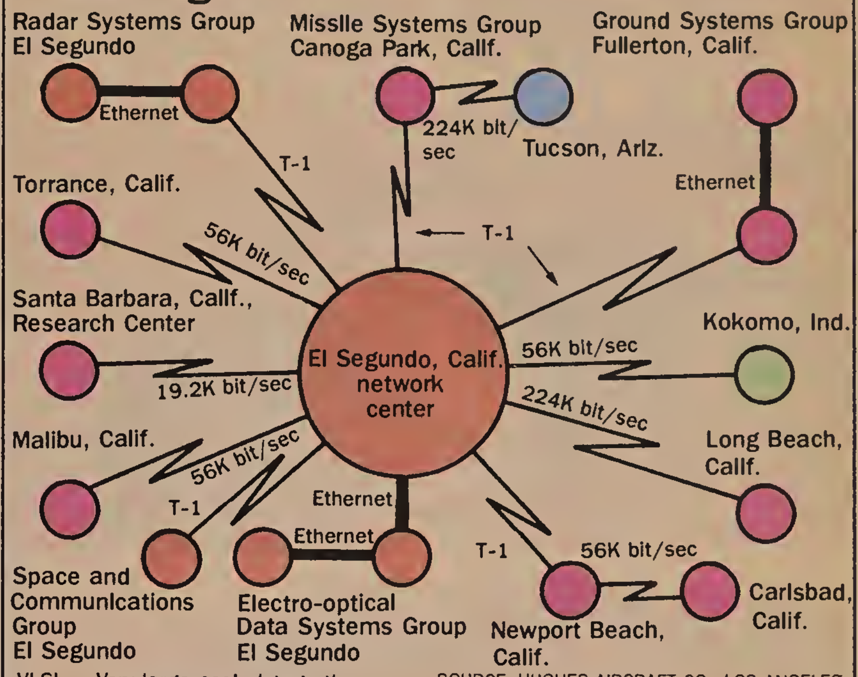
GM Hughes Electronics VLSI network



VLSI = Very large-scale integration

SOURCE: HUGHES AIRCRAFT CO., LOS ANGELES

LANMARKS

ERIC KILLORIN

LAN year in review

Already, 1987 has been a healthy year for the local network industry. The slump of 1985 and 1986 has given way to a turnaround, and many local net vendors have seen profit growth where last year there was more red ink than investors would have liked. With autumn in the air, it’s time to take stock of where the industry has come from and where it’s going.

This year, we’ve seen IBM make its most visible endorsement of peer-to-peer connectivity for Systems Network Architecture customers. Piles of new hardware and software products were introduced that promise desk-to-data-center integration. IBM’s Systems Application Architecture (SAA) is IBM’s elixir for its aging hierarchical model of computing — a patchwork approach to a slow and painful retrofit of SNA. SAA belies the monumental task facing IBM’s communications software developers as they try to make older applications work in a distributed environment.

On June 16, IBM congratulated itself for making “the largest communications product announcement in its history,” which really means that it takes more options to support peer-to-peer functions than would otherwise be the case. When you see more functions out of fewer products from IBM, then SAA will be fulfilling its mission.

Digital Equipment Corp., of course, has scored high marks in the local network business. The firm’s DECWorld ’87 show provided a first-hand account of how large networks can be managed and how first-time network users can “start communicating” with little expertise. The new release of Digital Network Architecture — Phase V — is compatible with the International Standards Organization’s Open Systems Interconnect (OSI) model, and subsequent phases of DNA will track directly with OSI. And, no doubt, so will IBM’s SNA. The term “proprietary” has earned the industry’s top honors as the least attractive word in the English language.

OSI has taken hold, and, through the efforts of the Corporation for Open Systems, it is no longer possible for local net vendors to pay lip service to OSI. 1987 will not be regarded as “the year of the LAN,” but as “the year of OSI.”

The market for independent local

See page 20

Killorin is the publisher of “Netline,” an industry newsletter on computer networks, a publication of Hyatt Research Corp. in Andover, Mass.

INTERNETWORKING PRODUCTS

NSC to support TCP/IP, Ethernet

BY PAULA MUSICH
Senior Editor

MINNEAPOLIS — In a move away from its long-standing proprietary networking stance, Network Systems Corp. last week announced Ethernet internetworking products and support for Transmission Control Protocol/Internet Protocol.

Network Systems, which sells the proprietary Hyperchannel high-speed local net for interconnecting mainframes, supercomputers and other large processors, unveiled a network router and three bridging products that will link Hyperchannel with Ethernet networks.

“It’s a major shift for our company,” said Craig Gust, director of product marketing. “We’ve committed to supporting the standards that make sense today. Ethernet and TCP/IP are de facto standards,” he said.

Network Systems hopes to penetrate the technical workstation environment with the new Ethernet and TCP/IP combination. Although Hyperchannel has sold well in MIS environments, Network Systems is finding many of its customers, as well as prospects, are looking for links between their Ethernet-supported workstations and larger processors. “We envision penetrating areas that were previously supported by point-to-point links,” Gust said.

“Network Systems has some transitions to make,” said David Terrie, president of NewPort Consulting, a network consulting firm. “If you’re not keeping up with the Joneses, it’s awfully hard to break into new sites. Tying those two [Hyperchannel and the Ethernet/TCP/IP combination] together is a good move for them,” he said.

The internetworking products will support both Hyper-

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NSC to support

continued from page 19

channel-50, a 50M bit/sec network, and Hyperchannel-10, a 10M bit/sec network that primarily connects personal computers and operates with the high-speed network.

The IP Router, which implements the Internet Protocol, links as many as four Ethernet networks to a Hyperchannel-50 network. When used with TCP/IP software in a Hyperchannel-attached host, the IP Router allows workstation users on Ethernet/TCP/IP combined networks to transfer files, send electronic messages and access applications in the host.

In routing information through a series of interconnected networks, the router automatically seeks the most efficient path. It includes 1M byte of buffer memory and can store addressing data for thousands of networks, subnets or network nodes. Up to 10,000 packets per second can move through the router, or 2,000 packets per port.

The three bridges support data link connections between an Ethernet network and Hyperchannel-10, an Ethernet and Hyperchannel-50, and an Ethernet bridge for Hyperchannel T-1 links. All of the bridges operate at the International Standards Organization's Open Systems Interconnect data link layer and allow a mix of upper layer protocols, such as Xerox Corp.'s Xerox Network Systems, Digital Equipment Corp.'s DECnet and TCP/IP, to communicate over the bridges.

The products will be available in the first quarter of 1988. The IP Router is priced at $35,000; the Ethernet-to-Hyperchannel-10 bridge is $8,500; the T1-Link bridge is priced at $12,500, and the Ethernet-to-Hyperchannel-50 bridge is $13,500. TCP/IP software is licensed on a monthly basis. ☑

LAN year in review

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network vendors has been interesting and promises to get even hotter during the next 12 months. Novell, Inc. and 3Com Corp. just released outstanding financial results for their recent quarters. Sales of their respective product lines have set the firms on steady, albeit parallel, tracks.

As of last week, the merger between 3Com and Bridge Communications, Inc. became a done deal, and the merged companies should be watched closely as they will undoubtedly strive to displace Ungermann-Bass, Inc., Proteon, Inc., Sytek, Inc. and Novell.

Developments on the Intel Corp. 80386 front also point to 1987 being a transitional year for local networks and a platform for additional market growth during 1988. As these hot-rod boxes take hold of executives' desktops, users will come to expect more from their network. File access times will become the benchmark by which users will measure their network's performance.

This makes a strong argument for higher throughput local networks, and it will place new demands on those vendors supporting data communications on nonshielded twisted-pair cabling.

Without question, the local net market is on much firmer ground than in any previous year. The market is consolidating, thus making for fewer, more stable players. Prices are dropping for network adapter cards to the point at which we'll see network connectivity built directly into the computer's motherboard.

The Ethernet and token-ring folks will continue to slug it out, but the cabling differences will become increasingly moot. Cable management, however, will become more of a concern. Where the 1960s had its forbidden glass-enclosed computer room, the 1980s and beyond will have the wiring closet. ☑

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Leading in Data Communications Test and Control

COMMUNICATIONS MANAGER

CCIA recruits 3 firms

The Computer & Communications Industry Association, a national trade group representing computer, information processing and telecommunications firms, has recruited three new members: Charles River Data Systems, Inc., manufacturer of Unix-based microcomputers, Honeywell Federal Information Systems, Inc., a subsidiary of Honeywell, Inc., and Hugin Sweda, Inc., which markets point-of-sale systems.

DISASTER PLANNING

User implements SNA net recovery plan

Texas agency contracts for network backup.

BY MARY LINEHAN
Staff Writer

AUSTIN, Texas — Fearing that a communications disaster would halt its critical work, the Texas Employment Commission (TEC) has implemented an ambitious network recovery plan.

TEC recently signed a five-year contract with Dallas-based Premiere Network Services, Inc. for disaster recovery services. With the help of that company, TEC has finally found a "workable" disaster recovery plan, according to one agency official.

"We've had a delay in getting a sound computer disaster recovery plan in place because of the network," said Charlie Remmert, assistant administrator for support at TEC. "You can get a computer into a cold site and get it up and running pretty quickly, but if you don't arrange to have phone lines going into that site, you don't really have a workable recovery plan."

TEC is a state-funded employment agency that offers job-matching services and pays out unemployment benefits. The agency has 2,000 terminals linked in an IBM Systems Network Architecture Synchronous Data Link Control network to an IBM 3084 mainframe here. The terminals, primarily Telex Computer Products, Inc. models, are housed in the agency's 153 remote locations throughout the state. Some locations also have IBM 3270 Personal Computers tied to the network. The workstations are linked to the network hub via AT&T multidrop lines, with six drops per circuit, operating at 9.6K bit/sec.

Remmert said Premiere Network Services provided TEC with a "cold site." "By 'cold site,' we mean a site designed and ready — with air conditioning, false floors, Halon fire protection and all — to move a computer into it," Remmert said. In contrast, a disaster recovery "hot site" is equipped with a duplicate computer system.

Remmert said that, in the event of some network disaster, the data center could be relocated to the cold site in Dallas, and the net could be up and running within two or three days. "We hope that we never need to deal with anything of that scale," he said, "but, if we had a disaster here, trying to get the phone companies — especially since the breakup — to get all those phone lines into a cold site could take a long time. With this contract, the phone lines will be up by the time the replacement computer is in."

TEC's recovery plan relies on Premiere's collocation with Qwest Microwave, Inc., a Dallas-based private telephone company that supplies bulk DS1 and DS3 capacity to other common carriers and long-distance companies. "If we lost the center here, our computer would be installed in the Dallas site and the next step would be to have our local Bell company reroute traffic to local Qwest offices," he said.

Leo Wrobel, founder and president of Premiere, explained that Premiere typically establishes a microwave or fiber-optic T-1 link to the client company, which allows traffic to be switched between Qwest and the cold site. Clients may keep their old access facilities in place, diversifying local access to the network.

Qwest operates in 32 cities in 14 states, including offices here and in Dallas, and is located within a quarter of a mile of AT&T or Bell company sites at all its locations.

Because of its recent inception, the recovery plan has not been fully tested, but it is scheduled to be tested by the end of the year.

TEC's contract with Premiere is at bargain basement prices, compared to current market value for this type of network backup. "We agreed on a giveaway price for the Employment Commission," Wrobel said. "They were good to work with because of their own logistic and technical expertise, and, given the economic situation here in Texas, we saw how critical their services are and the need for those services to be backed up reliably." Wrobel said the going rate for services such as those contracted by TEC is about $2,800 per month.

Disasters that can befall a communications net and potentially cost a company business include cable cuts, software/hardware failures within a company's own system, a fire at a data center, or an environmental disaster such as a tornado or hurricane.

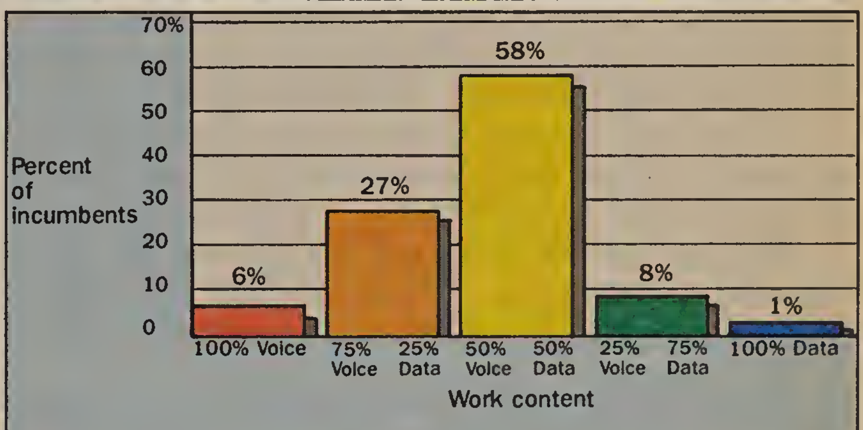
"One of the most common examples is a cable cut," Wrobel said. "Construction is going on, or the phone company is doing some work, and somebody backhoes an access cable between a data center and a service office." In many instances, Wrobel said that Premiere can utilize Qwest to switch transmission facilities, bringing network communications back up for their customer without the delay of waiting for the primary carrier. "Most of our clients just don't want to see the phone company's problems become their problems. They just don't want to have all the eggs in one basket," Wrobel said.

According to Wrobel, the telecommunications backup business has grown considerably since last February. "We get a lot of inquiries from brokerage houses and other financial services companies that simply cannot afford to lose their lines," he said. "And, since the AT&T incident in February, a lot of people have noticed us."

On Feb. 25, an AT&T switching computer failed, isolating the Dallas 214 area code and blocking 2,500,000 calls — incoming and outgoing — for about five hours.

"People are just realizing that, in disaster planning, you've got to determine that telecommunications needs are just as critical as computer needs," he said.

Voice/data responsibilities breakdown for directors and above



Based on 124 companies that provided information on 642 telecommunications professionals SOURCE: INTERNATIONAL COMMUNICATIONS ASSOCIATION, DALLAS

DIALOGUE

Is local network security a concern?

"Yes, security is an issue with local-area networks. We are in a highly sensitive industry, and we want to provide network access only for authorized personnel. We want to know who's on the network and why.

Carol Boerhaeur
Network coordinator
Foremost Insurance Co.
Grand Rapids, Mich.

"Absolutely, we're very concerned about security. Local-area networks are being installed almost uncontrollably in our company and, from an information manager's point of view, it's a problem. We don't know what everyone here has on local-area nets. There's some accounts payable, some accounts receivable and some personnel information. There's a need to secure that information.

Charlie Snell
Director of communications and computing
Harris Corp.
Melbourne, Fla.

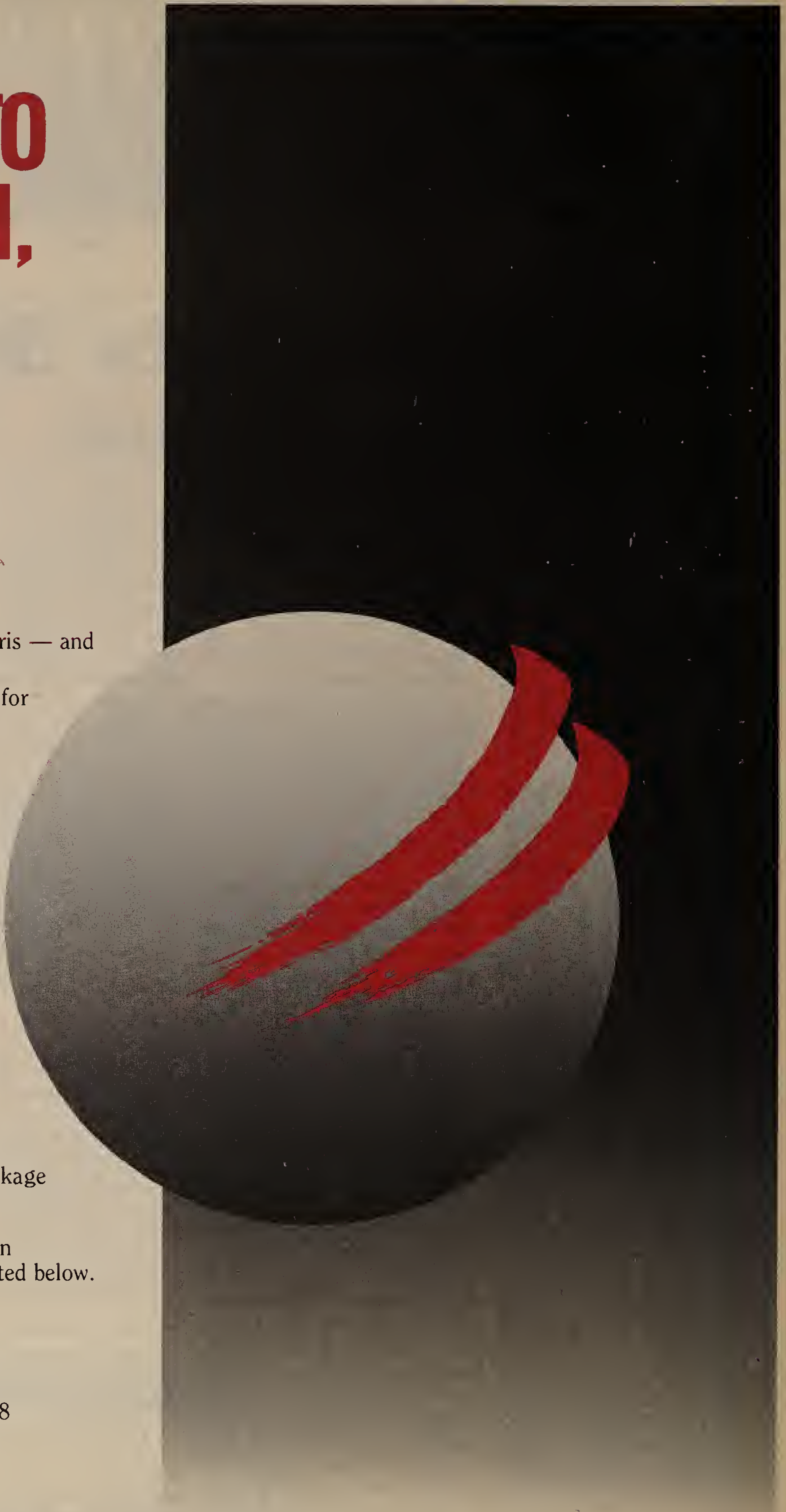
"We have several local-area networks and are anticipating purchasing some others. In our office, security has not been an issue so far, but I anticipate it becoming more and more of a concern. There are specific files and information, such as personnel information, that require restricted access.

Marko Milakovich
Director of communications engineering
First Data Resources
Omaha, Neb.

"Yes, security is definitely an issue. We don't have any local-area networks now, but we'll be using them in our new building. There are some users who should have access to certain data and others who shouldn't; some information is confidential. With local-area nets, there are a lot of benefits, such as sharing information. But along with the benefits come the security concerns.

C. Gerry Vargo
Director of the information services department
Little Caesar Enterprises, Inc.
Farmington Hills, Mich.

COMMUNICATION NETWORKS GOES TO PARIS AS RESOCOM, FRANCE'S FIRST COMMUNICATIONS EXPOSITION.



For the first time ever, Communication Networks goes to Paris — and delivers the volatile French communications marketplace to you.

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Resocom is being produced by Capric Organization, producer of several European shows including PC Forum, in conjunction with two IDG Communications' publications in France: *Telecoms International* and *Le Monde Informatique*. Serving as show coordinators in the United States is IDG Conference Management Group, an International Data Group Company.

NEW PRODUCTS AND SERVICES

See inside for:
- ▶Handheld data line monitor
- ▶Biscom facsimile interface
- ▶System 3/X-to-DDN gateway

WITNESS

Tesdata tool aids in call monitoring

SAN DIEGO — Tesdata Systems Corp. announced at the Tele-Communications Association conference here last week the Witness system, which enables a supervisor to monitor information displayed on the terminal of a telephone response agent.

Witness works with a user's host computer linked to an automatic call distribution (ACD) system. It enables a supervisor to monitor from one terminal information appearing on another. The ability to view the data screen presented to agents is an adjunct to an ACD's eavesdropping feature, which lets supervisors listen to an agent's telephone conversation.

While monitoring an agent's conversation with the eavesdropping feature, supervisors can use Witness to tap into the firm's host computer and obtain a mirror image of the data being transmitted to the agent. This monitoring process ensures the agent is following proper procedures and lets supervisors identify problems agents have with screen formats.

Witness consists of a Network Information Processor that taps into a group of up to 256 communications lines as they enter the host computer. Capable of being configured to work with most host systems, the unit passively plucks data from the lines and presents it via an RS-232 link to a Convergent Technologies, Inc. workstation, dubbed the Master Witness workstation. Up to seven other Witness workstations can link to the Master Witness workstation.

Witness' price starts at under $30,000.

Tesdata Systems Corp., a subsidiary of Infinet, Inc., is located at 460 Spring Park Place, Suite 900, Herndon, Va. 22070, or call (703) 478-9320.

TELE-COMMUNICATIONS ASSOCIATION

Infinet net control tools, modems bow

Firm unveils slew of offerings at TCA meeting.

BY JIM BROWN
New Products Editor

SAN DIEGO — Infinet, Inc. extended its family of network management tools and introduced new modems at the Tele-Communications Association (TCA) conference here last week.

Infinet upgraded its personal computer-based IDM Controller package, which monitors, tests and reconfigures the company's Integrated Diagnostic Modems (IDM). The new package features enhanced color graphics and works with the enhanced diagnostic features of newer IDM modems, including a synchronous clock frequency test capability.

It can also pass data via a serial link using a proprietary Infinet protocol to a Sun Microsystems, Inc. workstation running one of three new Network Information Systems (NIS) Series 90 packages the company introduced at TCA.

The new NIS Series 90 Manager I, NIS Series 90 Manager II and NIS Series 90 Integrator packages support windowing and color graphics. Each NIS Series 90 system also includes a relational data base that maintains a network transmission equipment inventory and historical trouble reports concerning that equipment.

The entry-level NIS Series 90 Manager I maintains IDM modem configuration files and tracks trouble reports on each modem. The package can be configured to remind an operator automatically when a modem has not been repaired within a specified time limit.

The package also tracks the number of modems within the network that have been added, deleted or moved. It enables operators to generate network inventory, trouble, configuration, activity and usage reports.

The NIS Series 90 Manager II expands the trouble-tracking capability of the NIS Series 90 Manager I by enabling managers to file the reports by various categories of network problems. It also enables the operator to assign problem resolution to various work groups.

When a new trouble report is generated, the NIS Series 90 Manager II will search its data base to report on similar problems. The package also enables operators to store data about user-reported equipment problems. In addition, the NIS Series 90 Manager II provides some 22 reports and seven graphs not supported by the NIS Series 90 Manager I.

Both packages enable a network operator at the Sun Microsystems workstation to instruct the IDM Controller to issue reconfiguration commands to IDM modems.

The new NIS Series 90 Integrator package collects data from an IDM Controller and from the diagnostic ports of Infinet's X.25 packet assembler/disassemblers, X.25 packet switches, T-1 multiplexers and Performance Measurement System (PMS) III.

Infinet's PMS III collects and processes statistical information about the data terminal equipment linked to its X.25, T-1 multiplexer or modem offerings.

In addition to supporting the trouble and network change tracking features of other NIS Series 90 packages, the NIS Series 90 Integrator enables an operator at a single Sun Microsystem workstation to issue reconfiguration commands to X.25 equipment, T-1 multiplexers or IDM modems.

Infinet also introduced three new IDM modems, the IDM 14FP Fast Poll, IDM Switch56 and IDM FT Fault-Tolerant models.

The new IDM 14FP is designed for multidrop networks. It uses a trellis-coded modulation technique to transmit to other modems on the multidrop line at 14.4K bit/sec while receiving signals from those modems at 9.6K bit/sec.

The new IDM Switch56 acts as a channel service unit/data service unit to support 56K bit/sec digital transmission via AT&T's point-to-point Digital Data Ser-

See page 24

PACKET NETS

Tymnet widens service options

BY BOB WALLACE
Senior Editor

SAN JOSE, Calif. — Tymnet/McDonnell Douglas Network Systems Co. recently introduced a 9.6K bit/sec dial-up asynchronous transmission service, expansion of its asynchronous Outdial service and a 2,400 bit/sec service for users of its X.25 public packet network.

Tymnet also announced support of Microcom, Inc.'s Microcom Networking Protocol (MNP), a protocol designed to ensure error-free data transmission over dial-up lines, and the addition of new network entry points in 22 cities over the next nine months.

This brings the total number of cities served by Tymnet to roughly 700.

Net speeds quadrupled

Tymnet's new high-speed service, TymDial 9.6, will quadruple the network speeds currently supported.

Clint DeGabrielle, marketing and field operations vice-president for Tymnet, explained that TymDial 9.6 will be based on modems manufactured by Concord Data Systems, Inc., of Marlborough, Mass.

> Tymnet's DeGabrielle explained that TymDial 9.6 will be based on modems manufactured by Concord Data Systems, Inc.

Compatible with CCITT V.32

The Tymnet service will also support modems compatible with the CCITT V:32 standard. TymDial 9.6 will be offered in 10 cities by year end, he claimed.

Tymnet's Outdial service will be made available through network entry points in 61 new cities, bringing the total number of the firm's entry points to 77 by year end.

Outdial service establishes dial-up links to unattended data terminal equipment, allowing Tymnet users to take advantage of low, off-peak service rates.

Tymnet has also added support for the MNP protocol. The value-added network provider already supports X.PC and intends to support Hayes Microcomputer Products, Inc.'s Asynchronous Framing Technique protocol at a future, unspecified date.

DeGabrielle said that network modem upgrades from 1,200 bit/sec to 2,400 bit/sec will be undertaken in a total of 33 cities. He would not identify the cities to be included in this project.

▶ *APPLIED DATA RESEARCH*

ADR E-mail combines voice, text messages

BY JOSH GONZE
Staff Writer

NEW YORK — Mainframe software vendor Applied Data Research, Inc. (ADR) unveiled an electronic mail system that offers speech synthesis capabilities and allows users to retrieve text and voice messages as well as information from corporate data bases.

With ADR's eMail-Voice, users can dial into a corporate data base from a push-button telephone and retrieve text messages synthesized into voice, according to Ray Altieri, senior product manager for E-mail at ADR.

The package is integrated with ADR's Ideal programming language and Dataquery relational data base management system, allowing information in a data base to be stored as an E-mail message. "There is enough intelligence for it to recreate phrases, sentences and numbers the same way you would say them if you were reading them out loud to somebody," Altieri said.

The system's digitization capability allows users to leave E-mail messages that are turned into binary code and recorded. Those messages can then be played back for other callers. Users who receive a message in text form can dial into the voice system to hear it.

ADR's eMail-Voice package runs on an IBM mainframe in conjunction with a text-to-speech package called CallText, which is personal computer software available from Speech Plus, Inc. EMail-Voice interfaces to CallText via the CallText Voice Gateway, also a Speech Plus product.

The eMail-Voice package operates under VSE and MVS with CICS; MVS with ADR's Roscoe; and VM/CMS and TSO under MVS. Users can access eMail-Voice via IBM 3270 or compatible terminals, teletypewriter terminals or compatible devices and push-button devices.

Pricing

ADR, an Ameritech subsidiary based in Princeton, N.J., is offering the package at prices ranging from $54,000 to $67,000, depending on operating system. Six-month, three-year and five-year leases are also available.

ADR is located at Route 206 and Orchard Road, Suite CN-8, Princeton, N.J. 08540, or call (201) 874-9000.

Infinet net tools, modems bow

continued from page 23

vice-56 (DDS-56) or Accunet Switched 56 lines. Switched 56 service provides a dial-up 56K bit/sec line when the primary leased DDS line goes down. It can also be used in configurations requiring high bandwidth but short connect times, such as teleconferencing.

The IDM FT enables users to house a primary modem and a hot spare in the same enclosure. When the primary unit fails, IDM FT circuitry automatically switches to the hot spare. Previously, Infinet linked a stand-alone primary modem to a stand-alone hot spare via a hard-wire cable.

Infinet also announced that it has teamed with Comdisco Disaster Recovery Services, Inc. to provide disaster recovery for IDM communications networks. Infinet and Comdisco will jointly offer three services.

Under the first, Infinet will duplicate a user's communications center at a remote hot site, enabling the user to switch all communications to that site during a disaster. Under the second plan, Infinet will store a duplicate prewired modem rack at the Comdisco site nearest the user. IDM modems will be flown into that site and installed in the racks within 24 hours of a central site disaster. Under the final plan, Infinet will furnish IDM modems for installation into the spare racks Comdisco supplies to its existing clients.

Prices for NIS Series 90 products include the cost of the Sun Microsystems workstation. An NIS Series 90 Manager I is priced at $22,995. The cost of the NIS Series 90 and an IDM Controller purchased together is $29,995. An NIS Series 90 Manager II is $39,995, and $49,995 with an IDM Controller. An NIS Series 90 Integrator costs $74,995.

An IDM 14FP is priced at $6,400, and an IDM Switch56 costs $2,349. The price of an IDM FT would be determined by the combined cost of the modems installed in the enclosure.

Infinet, a subsidiary of Memotec Data, Inc. of Montreal, is located at 40 High St., North Andover, Mass. 01845, or call (617) 681-0600.

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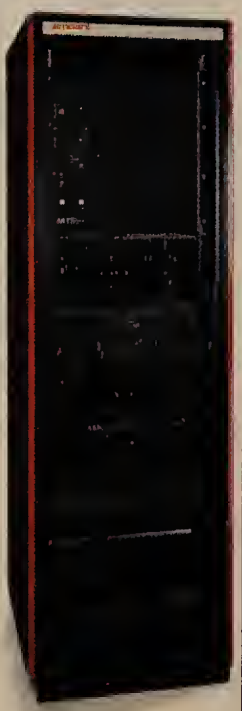

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First Look

Handheld data line monitor tests RS-232 lines

Reliable Communications, Inc. introduced a handheld data line monitor that tests asynchronous data transmissions between RS-232 devices at speeds up to 38.4K bit/sec.

Datatrap features a menu-driven display and a 28K-byte random-access memory buffer capable of storing up to four pages of data. The data buffer can be checked for past activity without interrupting current data flow through the monitor. Stored data can also be downloaded to a printer. Datatrap has a built-in feature that lets users quickly locate data in the buffer and determine remaining buffer space.

Datatrap is priced at $795.

Reliable Communications, Inc., 136 S. Wolfe Road, Sunnyvale, Calif. 94086. Outside California, call (800) 222-0042; in California, call (408) 733-1787.

Interface enables minis to transmit facsimiles

Biscom, Inc. enhanced its **Faxcom 1000 Fax-Communicator** product to enable Hewlett-Packard Co.'s 3000 series, Tandem Computers, Inc.'s NonStop II and Convergent Technologies, Inc. minicomputers to send and receive facsimile transmissions.

Previously, Faxcom 1000 Fax-Communicator enabled only personal computers to send and receive facsimiles. The new version links to the minicomputer via either a serial or parallel printer port, enabling operators to transmit text and graphics to CCITT Group III-compatible facsimile machines using a standard print command.

Faxcom 1000 features an autodial capability, which enables users to send the same document to multiple destinations by typing the facsimile numbers at the top of the page. The product also supports Novell, Inc. and 3Com Corp. print servers. Support for Digital Equipment Corp. VAXes and Wang Laboratories, Inc. VS minicomputers is planned.

Faxcom 1000 is priced at $2,495.

Biscom, Inc., 2 Courthouse Lane, Chelmsford, Mass. 01824, or call (617) 441-0010.

Gateway links IBM System/3X hosts to DDN

Carse, Woodworth & Associates (CWA) International, Inc. announced a gateway that links IBM System/34, System/36 or System/38 minicomputers to the Defense Data Network (DDN).

The IBM Personal Computer-based **DDN/3X Communications Gateway** links to a System/34, System/36 or System/38 processor supporting IBM's Qualified Logical Link Control (QLLC) protocol and enables those processors to access a DDN X.25 packet-switching circuit operating at up to 56K bit/sec. QLLC is IBM's implementation for transmitting X.25 packets over a Systems Network Architecture network. The gateway makes the QLLC protocol compatible with the DDN X.25 implementation to enable System/34, System/36 or System/38 processors to communicate with other System/34, System/36 or System/38 processors and 5250 terminal controllers via the DDN.

The product will support up to 32 concurrent QLLC sessions over the DDN X.25 circuit.

The product collects statistics, error counts and usage information for X.25 sessions and circuits.

Pricing for the gateway starts at $30,000.

CWA International, Inc. is located at 18805 Cox Ave., Suite 200, Saratoga, Calif. 95070, or call (408) 378-3414.

PC software automates OnTyme usage

McDonnell Douglas Applied Communications Systems released IBM Personal Computer software that automates the creation, sending and receiving of electronic mail messages via its OnTyme E-mail service.

The menu-driven **Personal OnTyme** enables users to create new messages with an integral Quick Note feature or with their favorite word processing package. It also prepares existing files — such as Lotus Development Corp. 1-2-3 spreadsheets — for transmission before connecting to OnTyme. This process trims the connect time associated with OnTyme usage. It also enables the user to modify, receive, view, answer, print, move, copy, delete or forward OnTyme messages.

Single copies of Personal OnTyme are available for $95. Volume discounts and site licensing are also available.

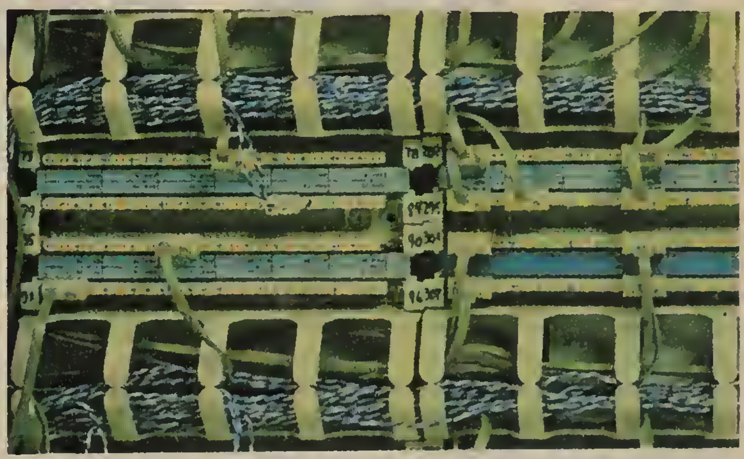
McDonnell Douglas Applied Communications Systems, 2650 N. First St., P.O. Box 49019, San Jose, Calif. 95161, Attn. ACS Telemarketing, or call (800) 435-8880. ◘

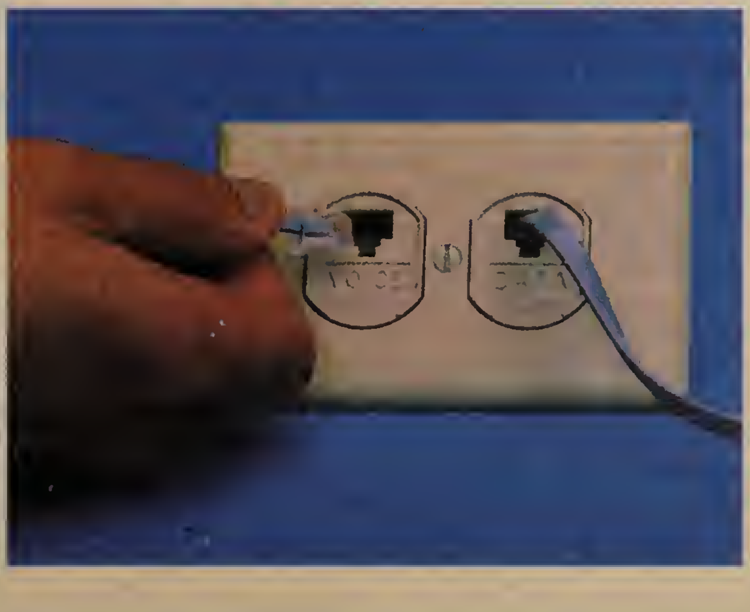
AT&T AND FOREST DATACOM SERVICES JOIN FORCES TO MAKE OFFICE MOVES MORE FLEXIBLE.

AT&T's Premises Distribution System (PDS) is a multi-functional systems design to support voice, data, graphics, and digital video communications on a customer's premises. It comprises cables, cross connects, adapters, electronic and protective devices which are arranged in a logical, coherent, and economical manner.

With PDS, it is now possible to use all your equipment (voice and data terminals) on the same wiring scheme—and even to plug voice and data terminals into a standard wall outlet.

Forest Datacom Services is an authorized turnkey installer of registered PDS in the greater New York area. Because of our installation expertise and experience, we offer a five-year warranty on the performance and the workmanship of the system. Forest Datacom Services is also the pre-eminent single-source vendor in the data and telecommunications field. Our agreement with AT&T is just one of many recent agreements which establishes Forest Datacom Services as a major value-added vendor for installing and maintaining communications systems.





So, if you face frequent or major office moves, you should move to AT&T's PDS and you can be confident that Forest Datacom Services will deliver a quality installation.

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Opinions

SUPERCONDUCTIVITY

MICHAEL M. DEDIU

The sky will be the limit

Superconducting materials promise to advance the state of technology to new and unprecedented levels. But how this will affect the communications industry and how soon are open questions.

An interesting fact about superconducting materials is that it is possible to improve the conduction of electrical signals in both speed and intensity. Since all electrical systems use conductors, an improvement in superconducting materials could revolutionize the utility, electronics and computer industries, as well as the communications industry. This revolution, however, is still only speculative, since the breakthroughs required haven't appeared yet.

For superconductivity to be practical, the conducting materials must be inexpensive and relatively easy to manufacture. Standard copper cables are now being produced by machines at a rate of more than 50 miles per hour. New materials must be able to be manufactured at these speeds to meet demand.

If they are to replace conventional wire, the new materials must also operate in a wide range of temperatures, and they must be ductile and flexible. In other words, a metallic superconductor is needed. The nonflexible materials, such as ceramics, now being developed don't meet any of these criteria, but they could be used to improve speed in rigid, solid-state circuits.

If inexpensive, metallic superconductors are developed, they would compete with the emerging medium of fiber-optic cable and the established satellite communications system. These systems could easily coexist, being used according to need, cost-effectiveness, efficiency and security.

Security is a serious problem for superconducting wire because it would emit strong magnetic fields that could be easily detected without physically tapping the wires. The wires would have to be heavily shielded to prevent this and to protect other electromagnetic transmissions, and this would certainly add to its cost.

If these problems are solved, then superconducting wires could be used to improve substantially the volume and quality of current communications systems for both voice and data.

There is, as there should be, an increasing demand for faster, less expensive, more efficient and reliable communications lines. Anyone using a dial-up line and a personal computer would likely want faster communications speeds. If the connection is distant, dial-ups become expensive, and lower priced rates become more essential.

Users have a serious need for better lines, and they're not going to tolerate the current system indefinitely. Computers are getting faster, and users have increasing amounts of information waiting for fast transmission. Users could see substantial improvement in communications speeds in the future, once metallic superconductors become practical. But how this will occur is still open to debate. More research is necessary, and researchers and engineers must carefully weigh the capabilities of current and potential systems. Also, the capabilities of today's systems must be better understood to forecast the future of superconductive systems successfully.

The communications systems developed by the common carriers to provide transmission of voice and data signals pass information to and from multiple users primarily with time-division multiplexing and frequency-division multiplexing. These methods of using one line for more than one user are the reason for the enhanced capability of the current communications system. Carrier links now in use include open-wire pair cable, twisted-pair, coaxial cable, fiber-optic cable, submarine cable, troposphere scatter radio, microwave relay and communications satellites. These transmission methods are being refined, but their current capabilities are severely limited compared to similar methods utilizing superconducting materials.

Multiplexers using superconductors internally could channel information into networks faster than ever before. Superconducting transmission lines could carry that information much faster than previously possible and, therefore, at a potentially much lower cost per bit.

Users should not look to superconductors for help just yet. The technology won't see thorough implementation for another 10 to 20 years. But with needs for more information and transmission capability growing daily, there will definitely be a market for it when it gets here.

Dediu is president of Dediu Computer Consultants in Tewksbury, Mass.

NEW SERVICES

STEVE MOORE

CLASS controversies

Within the next 10 years, new public network signaling and switching technologies will, paradoxically, both aggravate and eliminate the telephone tag problem. Ultimately, calls to those who want to be avoided may never be completed, while calls to parties who do wish to speak with the caller will seldom fail to reach their destination.

New calling options, because they may revolutionize the way people conduct their everyday business, will raise ticklish new regulatory questions. The basis for this future ferment lies in Custom Local Area Signaling Services (CLASS). These services will become available as telephone companies slowly deploy central office equipment that supports Signaling System 7, a new common channel signaling scheme that enables information about specific calls to be communicated, stored and manipulated.

CLASS services, built largely on the capability to identify the number of the calling party, open up seemingly endless new communications possibilities. You may simply purchase a phone set that displays the calling number. Then, if you know the number displayed and associate it with an individual, you can anticipate what to say — or choose not to answer. With a more sophisticated handset, you could create a data base of all the people in your little black book, and the phone would display their names, numbers and other information about them when they call.

Next comes call screening, which enables you to accept or reject calls selectively. With sophisticated software, you could build a labyrinthine screening system. Some callers might never hear anything but a busy or ringing signal; others might be diverted to an answering machine.

If calls are diverted to a voice-messaging system, customized messages could be delivered to individual callers or groups of callers before the system allows them to leave their messages.

Finally, the calls you want to take would be allowed to ring. Particularly important callers could be assigned distinctive rings and perhaps even distinctive call-waiting tones.

Eventually, your phone number will go with you wherever you go, as long as you periodically update the intelligent network on your whereabouts. If you and your associates all have both CLASS services and mobile phones, you may be among the lucky few for whom telephone tag will be eliminated.

But what if, when you actually allow some number to ring your phone, you aren't able to answer it before the caller hangs up? CLASS services will also include last-number redial, so you'll be able to call the last number that dialed you and find out who it was.

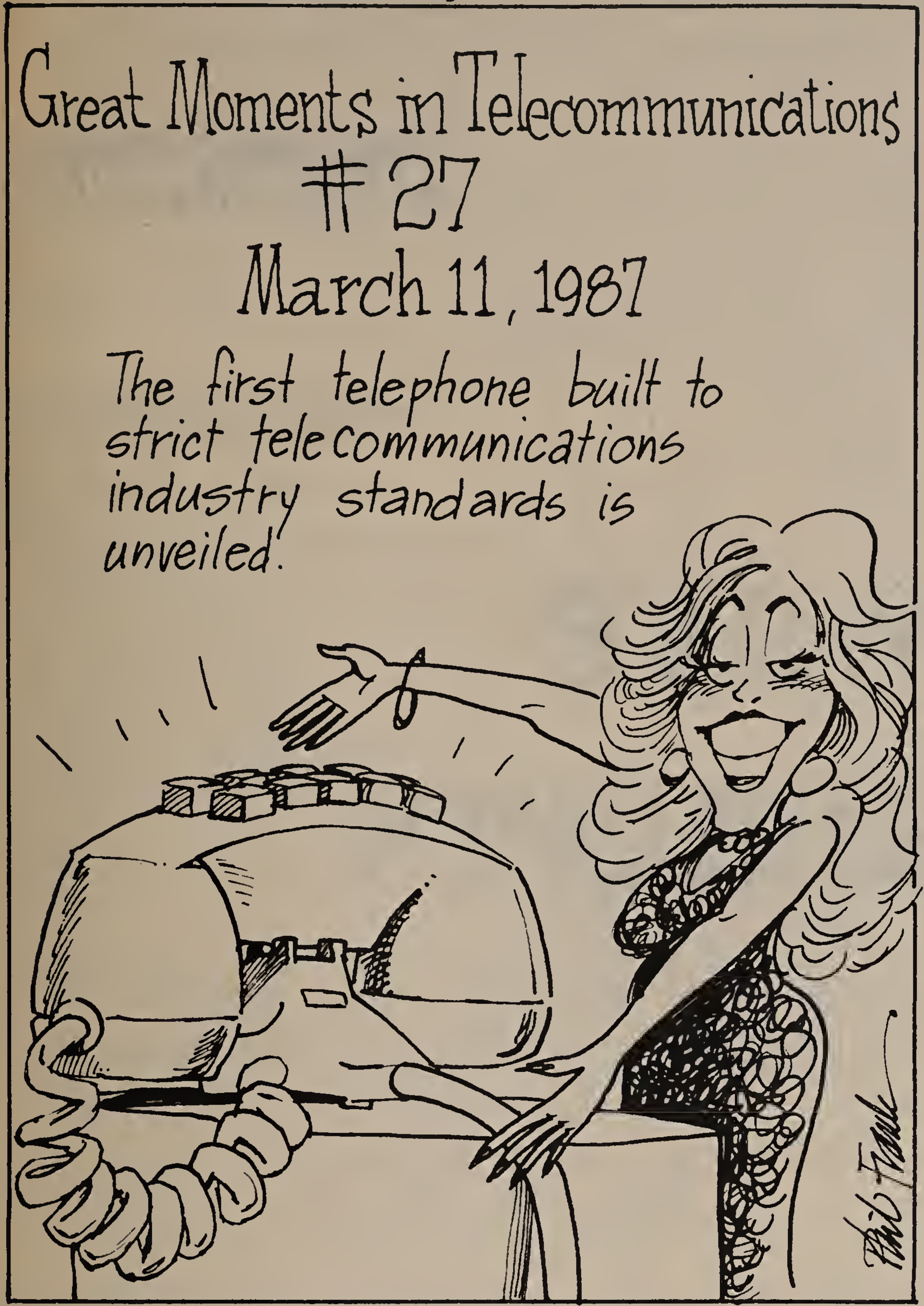
If you call that number only to reach an obnoxious salesperson or a crank caller, and that individual won't reveal where the call is coming from, don't worry. CLASS services are also expected to include the ability to trace calls. Either on your own or with the help of the phone company, you'll be able to learn the location of the caller and complain to the Better Business Bureau or the police. And, of course, you'll enter the number into your call-reject data base.

Moore is features editor of Network World.

Our editorial pages are what your thoughts make of them. Contribute by writing a column for *Network World*. Manuscripts must be letter quality, double-spaced and approximately 600 to 750 words in length. Disk or modem submissions are preferred. Columns should be timely, controversial, literate and technically accurate.

Contact Steve Moore, features editor, *Network World*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701, or call (617) 879-0700, ext. 732.

▶TELETOONS — By Phil Frank


Great Moments in Telecommunications
#27
March 11, 1987
The first telephone built to strict telecommunications industry standards is unveiled.
Phil Frank

Widespread use of call-rejection options conjures up visions of calls bouncing around the network, being diverted from phone to phone, tying up network facilities until they either are abandoned or finally reach some unlucky recipient. Random number dialers, now used principally by telemarketing firms, could be used to foist unwanted calls onto unsuspecting third parties. While this last scenario may be unlikely, it seems certain that state and federal regulators, users, carriers and equipment vendors will square off in hot debates on CLASS-related questions:

- Should the caller identification system be universal and automatic, or should telephone users be allowed to prevent their phone numbers from being revealed to others, depending on who they're calling?
- At what intervals, and over what maximum period of time, should automatic number redialers be allowed to operate? Conceivably, a persistent caller whose number you have instructed your phone to reject could tie up your phone by instructing his phone to dial your number continuously for several hours. However, you might not be aware of it since the calls are all being rejected.
- With automatic reconnect or dialback, the intelligent network may provide callers the capability to keep several callbacks going at once. But how many simultaneous callback processes should each user be allowed to maintain, given that each such process incrementally ties up network facilities?
- Should there be any limit on the use of automatic call forwarding devices? Should phone company data bases store complete line-history memories on calls that have been forwarded one or more times, so they can be traced?
- Should there be restrictions on the ability of phone subscribers to trace calls? Should phone companies be allowed to control the call-tracing function by requiring that they, not subscribers, actually conduct the trace? Which is the invasion of privacy: an unwanted call, or the tracing of that call?

Users should keep abreast of CLASS issues and make their desires known as debates over specific services heat up. If these services evolve in an equitable manner, businesspeople may finally gain precise, direct control over their telephone communications. ☑

INDUSTRY EXHIBITIONS

JAMES CARLINI

Use your show smarts

Communications managers are becoming satiated with trade shows, as evidenced by recent shows that were flops in terms of attendance by both exhibitors and users. The fact is, there may be just too many shows to attend.

The National Computer Conference (NCC) in Chicago last June had a great program yet suffered from lack of attendance. Part of the problem may have been the unfavorable preshow press coverage about the expected low turnout, which may have scared off some potential exhibitors and attendees. Poor turnout at a trade show is disappointing, and the NCC is just one of several shows across the country this year that had a less than exciting turnout.

If the problem is too many shows, what type of show should users go to? Some attendees may go to a trade show based on its location. For example, some may go to a show in Las Vegas because they want to party and gamble, regardless of whether or not it's a good show.

But most managers attend trade shows to gain insight into what's going on in the industry. Attendees are exposed to the perspectives of exhibitors, the press, speakers and other attendees. But many exhibitors, communications managers and others feel they're getting shortchanged at some shows.

Without a strong mix of exhibits and seminars on topics of current interest, trade show attendance is low, and press coverage is, inevitably, negative. And, for show promoters, low attendance is the kiss of death when it comes to trying to get exhibitors and speakers back the following year.

Another reason for low attendance may be that companies are restricting employee attendance as the number of shows proliferates. And while many industry trade shows are floundering, vendor-sponsored shows, such as last month's DECWorld '87 in Boston, are packing in attendees. DECWorld and other such shows succeed because they have a focused theme surrounding specific products and applications.

Many users have already chosen a path and selected a communications and information system architecture. As their implemented architecture becomes mature, more general shows may become less appealing. However, such thinking is shortsighted; general trade shows keep managers abreast of industry trends.

Managers need to take a second look at all trade shows. They should ask questions about each show, prioritize them and select the best ones for their needs. Managers should ask: Am I going to learn something about a technology or product that we're considering? Will I meet some of my peers who can offer insights about their projects? Will some of the speakers be discussing topics that are of interest to my organization?

When communications managers attend a show, they must also remember to ask questions. Often, no one in the audience asks speakers or panelists any questions. Yet, these groups have a wealth of information that's available for the asking.

Trade shows are a good opportunity for managers to find out what their peers are doing within their specific industries. In addition to trading notes with other users, managers may find speakers addressing communications issues specific to their industries.

Managers should consider attending sessions that address issues in other industries, as the solutions presented may be applicable to their own situations. Trade shows are also a good place to check out new publications that may provide insights into areas in which a manager lacks firsthand knowledge.

Finally, managers should start analyzing trade shows by making a list of reasons to go to each and then by listing any significant learning experiences they've had previously at that show. The shows that don't result in any significant addition to the manager's technical or managerial skills should perhaps be skipped next year in favor of other shows.

Like anything else, managers must experiment with new trade shows to find those that best suit their needs. ☑

Carlini is president of Carlini & Associates, a management consulting firm in Westmont, Ill. He also lectures on information technology at Northwestern University in Evanston, Ill.

NETWORK WORLD
Features
October 5, 1987

▶ *BYPASS PRIMER*

Microwave for managers

It's 15 minutes before you're supposed to leave for that dream vacation. Suddenly, your boss runs in and informs you that he needs an evaluation of microwave communications systems as an alternative to telephone company private leased-line service — and he needs it on his desk before you leave.

BY ERIC GOTTESMAN AND PAUL DAUBITZ
Special to Network World

Don't panic. Although microwave communications can be a technical and complex topic, the executive summary of microwave alternatives presented here may help you prepare your report quickly so you won't miss a day at your tropical paradise.

Short-distance solution

Various microwave transmission systems are available as alternatives to local leased-line service. Microwave radio was once used primarily for military applications, long-haul common carrier transmission and the special communications requirements of utilities, railroads and energy companies.

Today, network managers are using these systems increasingly for point-to-point transmission of voice, data and video over short distances.

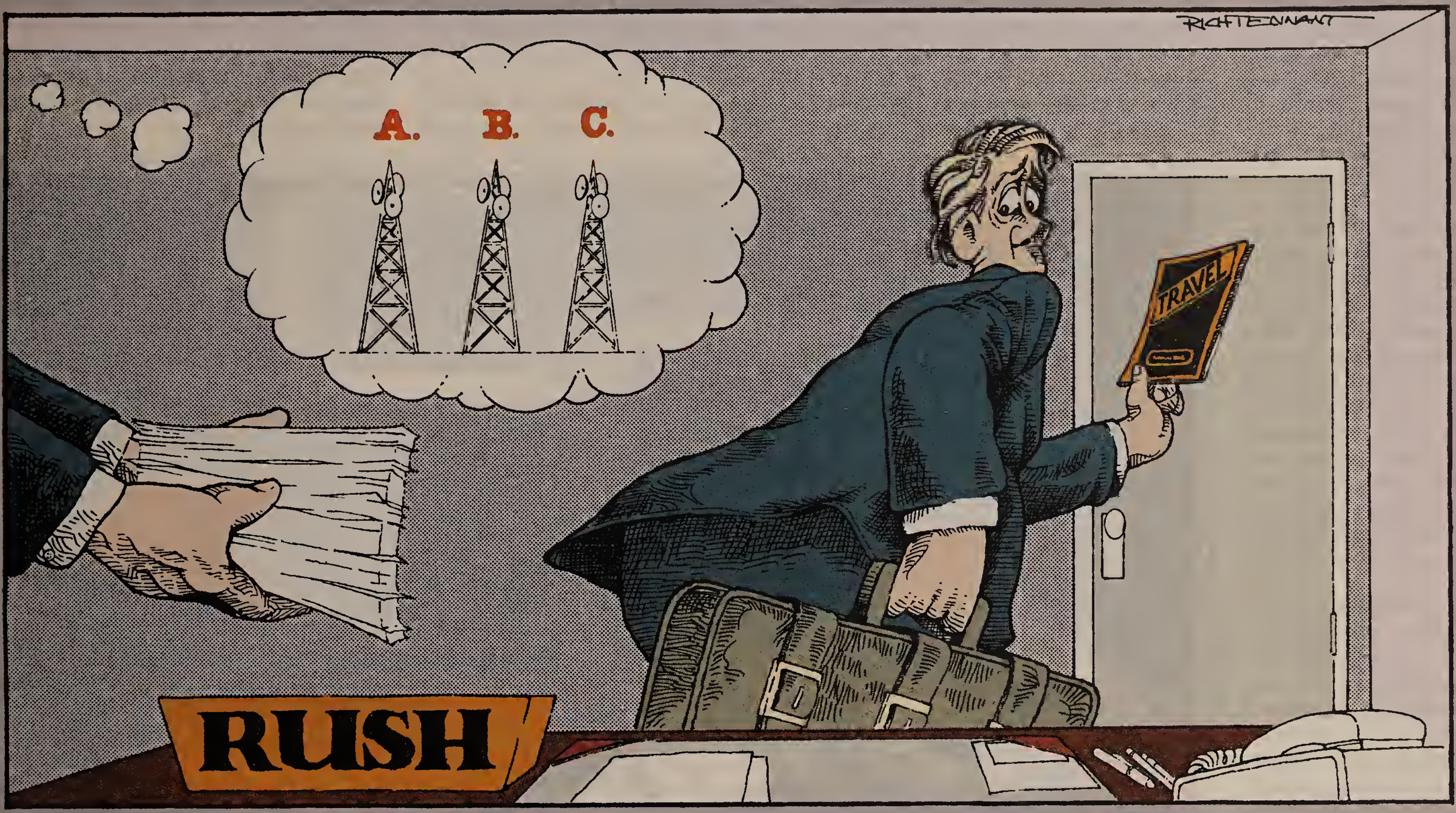
> Here's how to explain microwave bypass systems to top management.

Microwave systems are used in campus environments and for intracity and short-haul intercity links. Microwave may also provide a bypass solution for connecting to long-distance carriers.

Unlike leased lines, microwave systems don't require long installation lead times. And unlike private fiber links, microwave links don't entail tearing up a street to lay cable between buildings. Cables also require conduit space, which is often prohibitively expensive and can be extremely difficult to find at any price.

Commercially available microwave systems provide communication between two points via a focused beam of extremely high-frequency radio energy, usually at a frequency between 2 and 23 GHz. The system's two radio transmitters must have an unobstructed path between them so their anten-

Gottesman is a telecommunications analyst in New York. Daubitz is president of ATI Telemanagement, Inc., a telecommunications management consulting firm in Newburyport, Mass.



nas can be aimed directly at each other.

Implementing a microwave communications system requires sophisticated site analysis and path engineering to provide optimal performance.

Maximum path length, antenna placement and reliability calculations are based upon a variety of climatic and topographic conditions. Loss of signal strength, or attenuation, occurs as result of transmission through atmospheric obstacles. Adverse conditions such as rain, snow, fog, smoke and humidity can greatly reduce the distance over which any microwave system can reliably perform. For example, a system that performs well over a 10-mile path in Phoenix may only work over a fraction of that distance in Chicago.

Attenuation is inherent in all microwave systems, which are designed to tolerate a certain amount of signal degradation. Because attenuation increases with transmission frequency, higher frequency microwave links are limited to shorter path lengths.

Congestion in the lower frequency bands has made it difficult to secure a path and license new long-haul systems in major metropolitan areas. However, the opportunity for short-haul private microwave networks emerged several years ago when the Federal Communications Commission made the 18-GHz and 23-GHz bands available to common carriers and private users.

A number of 18-GHz and 23-GHz microwave systems are currently available for private users. These fully engineered, licensed turnkey microwave systems are available from a variety of vendors, common carriers and consultants. Maximum path length, information-carrying capacity and costs differ for each system and with each installation. Capabilities range from short-distance, low-speed data links to systems that can transmit over 15 miles at speeds of 45M bit/sec, the equivalent of 672 64K bit/sec voice-grade circuits.

Prices vary from less than $15,000 for a basic low-capacity, nonredundant system to far more than $50,000 for a system that provides a high-capacity (T-1 or greater) channel. However, complete system prices depend on each user's network requirements and may be considerably higher.

Frequency trade-offs

Generally, 18-GHz microwave systems are capable of greater path lengths, carry more information and are more expensive than

Continued on next page

ILLUSTRATION ©1987 RICH TENNANT

From previous page

23-GHz systems. Because 18-GHz systems also perform better in inclement weather, network managers in rainy climates may prefer 18-GHz systems, all other considerations being equal. However, the choice between 18 or 23 GHz will vary with the application.

Reliability calculations are used to forecast the number of minutes per year that a link may be out of service due to weather conditions. Such calculations are complex and are based on many factors, including transmission distance, atmospheric pollution and climate.

The importance of the actual communications application will determine what steps should be taken to ensure reliability. If the application involves batch processing, then 100% availability may not be as critical as if the application involves real-time, interactive, high-speed data communications.

Redundancy is one method for improving reliability. For example, an additional microwave link using alternate routing might be considered, and leased lines can be used for applications requiring dedicated circuits. When the microwave system is inoperable, the user might design his system so that voice traffic from the company's private branch exchanges can be rerouted to the public switched network.

It may not be necessary to have 100% of a microwave system's capacity available at all times, but some critical applications may require that a specific percentage of total capacity be available continuously. These applications may require automatic switching to a hot-standby facility if the microwave system goes down.

Licensing requirements

The FCC requires that microwave systems be licensed and supporting engineering documentation be provided to demonstrate that no interference with previously installed links will occur.

Licensing 18-GHz and 23-GHz microwave systems is relatively simple compared with lower frequency common carrier systems. Licensing is on a first-come, first-served basis, and the system can be licensed as a common carrier or private network system. Any intention to share network facilities or resell services should be considered when applying for an FCC license.

Complex path engineering is required to ensure that the system doesn't interfere with other systems, and it must comply with radiation exposure standards.

Microwave communications systems typically transmit by radiating only a fraction of a watt of energy from the front of the transmitting antenna. The FCC has adopted ANSI standards for microwave radiation levels in lieu of a federally promulgated standard. Evidence that the system complies with these standards must be provided for licensing. The user is responsible for measuring and documenting the system's power levels to ensure compliance with ANSI standards.

Additionally, the system must comply with Environmental Protection Agency standards, which ensure that people working in the vicinity of the system are not exposed to excessive microwave radiation.

Also, a few states and municipalities have developed local regulations that must be followed for system installation.

Many people are still not comfortable working near microwave radio equipment, particularly when it's mounted in an office window. Before a microwave system is implemented, employees should understand that very low power levels are involved and that the equipment will be physically inspected for compliance with all regulations.

Costs considered

Financial analysis of microwave alternatives involves determining the total cost of leased-line service over a specific period of time and comparing it with the total cost of a microwave system over the same period. Each organization has its own financial-analysis methodology. The manager may simply add up all the costs and compare them, or he may conduct a sophisticated discounted cash-flow analysis that takes into account the company's current cost of capital and a variety of other factors.

The key to a successful analysis is to include all capital costs and expenses for each scenario. It's vital that end-to-end configurations for all system alternatives be laid out and their costs detailed. Telephone company leased-line service costs are distance-dependent, while microwave communications costs are generally distance-insensitive.

Leased-line costs must include all the circuit segments as dictated by tariffed rates or as determined by special assemblage cost quotations.

Costs should include the segment of the circuit connecting the first building with the nearest telephone company central office and the segment of the circuit running from the central office to the second building.

When connecting different communications systems, it's best to put all your eggs in one basket.

If the buildings are served by different central offices, interoffice channel costs must be added to the intraoffice costs.

It's possible that buildings across the street from each other may be served by different central offices and that a long, expensive interoffice channel is required. This could raise the price of leased lines considerably. In addition, any expected rate increases and access charges should be included in the cost estimates, as should any equipment that must be purchased or leased.

Implementing a microwave communications system initially requires a large capital outlay. In addition to the capital costs for radio equipment, interface equipment, mounting hardware and tower construction (if necessary), the financial analysis must include ongoing costs such as leased-line backup systems, rooftop space rental, equipment rentals, licensing and maintenance fees.

The communications manager may be able to mount microwave antennas in building windows, rather than on a rooftop or tower, if a clear line of sight is available from this position. This saves the company the costs of roof- or tower-mounted systems, which comprise not only mounting the hardware but higher installation costs and monthly rental fees for rooftop real estate.

Microwave towers can cost many times more than the communications equipment, depending upon the height required.

A basic microwave configuration is designed as an alternative to a particular number of leased circuits. Future increases in the capacity of a microwave communications system may entail no additional cost if unused capacity is available on that system.

However, the incremental cost of expanding a system by purchasing additional equipment may be quite high and might involve replacing the entire system. This cost should be compared on a case-by-case basis against incremental circuit costs for additional leased lines.

When all analyses are complete and total costs are known, then all alternatives can be compared on an equal basis. Each situation will differ, and for some network managers, the results may be surprising. In some cases, a microwave system may have a payback period as short as nine months and may save thousands of dollars over the system's life.

Possible problems

Short-haul 18- or 23-GHz microwave systems provide highly reliable service, but like any other piece of equipment, they require maintenance. Rooftop- or tower-mounted systems are continually exposed to weather conditions and should be checked regularly by qualified personnel.

The easiest way to ensure timely maintenance and repair is through a vendor-provided service contract. The contract should ensure that the vendor will keep critical system components in inventory and should stipulate maximum response times and arrangements for backup equipment loans.

Risk is another factor that warrants careful analysis. Although microwave radio systems can be extremely attractive financially, they're not risk-free. The first step in planning for a microwave system is to make sure that an FCC license can be obtained in the user's area. Another consideration is whether a building might be constructed in the system's path.

Also, the FCC can require frequency changes because of interference problems. This can be an expensive problem if the user must change equipment to change frequency. The equipment design and its ability to support such changes should be considered. Many risks may be difficult to forecast and quantify, but it's important to identify as many as possible.

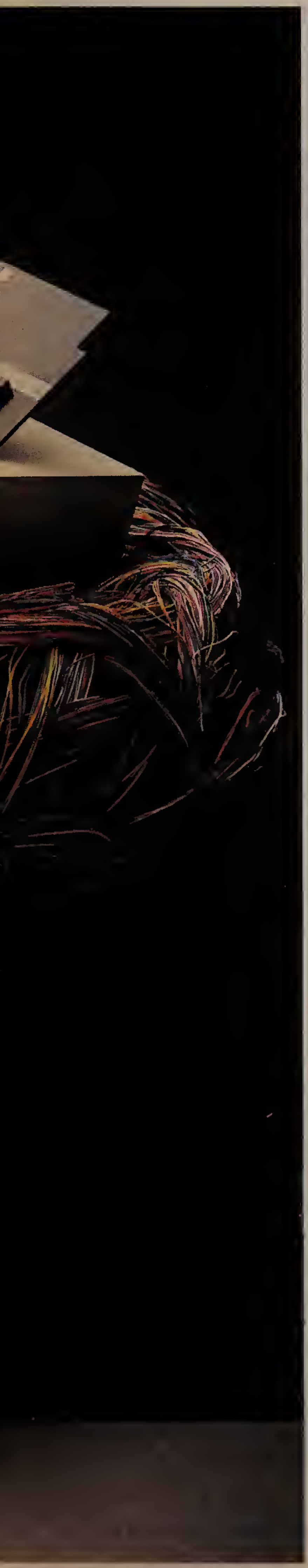
Examine the alternatives

Purchasing a microwave communications system is not the only alternative to leased-line services. A number of common carriers, as well as users with excess capacity, are interested in providing users with transmission capacity on attractive terms.

With technologies such as fiber-optic- and cable television-based transmission, rights of way and conduit space become important issues and can make these systems prohibitively expensive to implement.

Alternately, infrared communications systems, which use infrared light beams, offer low-cost data transmission over very short distances — less than one mile — and require no licensing. However, these systems support low data rates and are much more sensitive to inclement weather than are microwave systems.

Finally, because of the many variables involved in implementing a microwave system, communications managers should seek turnkey systems available through equipment vendors and common carriers. Users without previous microwave experience should consider retaining an experienced consultant. ☑



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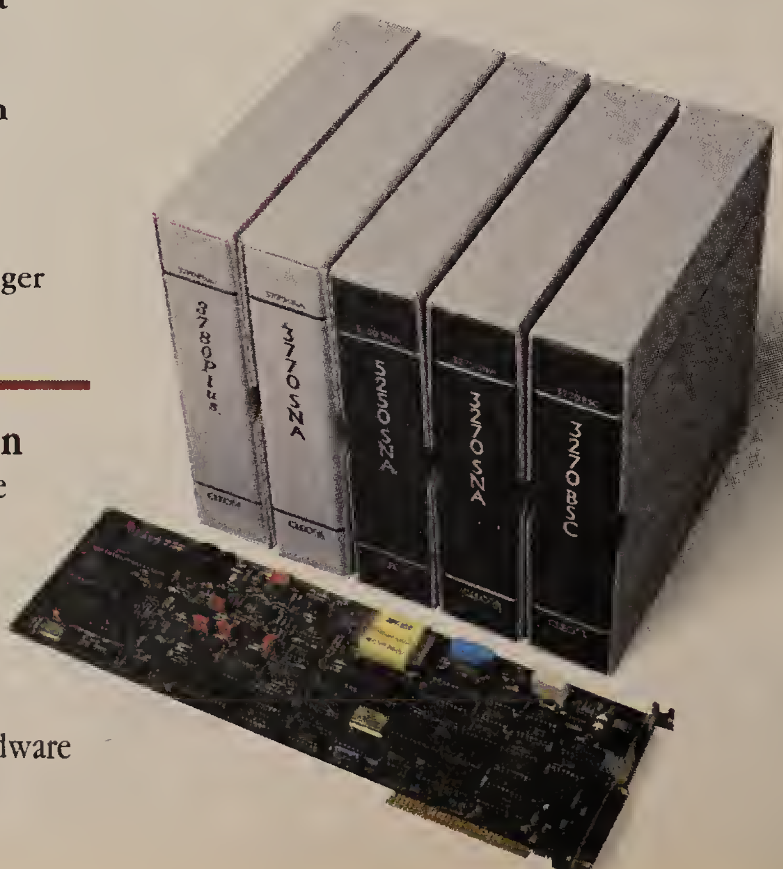

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Product Focus: Bridges and gateways

Supplying the missing link

Continued from page 1

bridges may adversely affect time-sensitive applications.

Gateway selection is even more complex due to the different levels of services provided. For example, some gateway vendors claim the protocol conversion they use to link dissimilar networks is transparent to the user. This isn't necessarily so, especially if file transfers are being performed. Users who plan to implement IBM's LU 6.2 protocol to obtain peer-level communications should be aware that they might be required to write some fairly sophisticated application interface programs.

Bridges and gateways span the gaps between today's disparate networks.

Gateways allow products with dissimilar communications architectures to exchange information through multilevel protocol conversion, while bridges provide logical links between physically distinct local-area networks that use identical protocols.

Gateways and bridges are available to link local and remote networks. Most of the gateways listed in this article are intended for use with local-area nets and comprise hardware and software that's used

Continued on page 35

Hunter is president of TMS Corp., a telecommunications consulting firm in Devon, Pa.

Gateways

Vendor	Product	Connectivity	Emulation	Protocols	Simultaneous sessions	Layer/level support	Trunk speed (bit/sec)	Price
Advanced Computer Communications, Inc. **Santa Barbara, Calif.**	ACS 420 Ethernet	Ethernet Version 1 and IEEE 802.3 to Defense Data Network (DDN)	Not applicable	Ethernet and DDN X.25	Unlimited	OSI Layer 3	256K	$12,900
Applitek Corp. **Wakefield, Mass.**	SNA Gateway	Applitek Unilan to SNA	IBM 3274/3278	SDLC or BSC	32	SNA Layer 6	56K	$11,700 to $18,600
Banyan Systems, Inc. **Westborough, Mass.**	BNS Network Server	Xerox Corp. Ethernet, IBM Token-Ring Network, Proteon, Inc. ProNET, Datapoint Corp. Arcnet, DSC Nestar Systems, Inc. Arcnet, Allen-Bradley Co. VistaLAN and Corvus Systems, Inc. Omninet to each other	IBM 3274/3278, 3279, 3287	SDLC or BSC	64	OSI and SNA Layer 7	56K	$3,490
Bridge Communications, Inc. **Mountain View, Calif.**	GS/3	Any XNS or TCP/IP local network to same	Not applicable	XNS, TCP/IP	8	OSI Layer 3	64K	$10,500
Codex Corp. **Canton, Mass.**	Model 4255 Gateway	Any asynchronous or BSC device to SNA/VTAM	IBM 3271, 3274, 3275/3278, 3777, 2780/3780	Asynchronous, BSC, SDLC	40	SNA Layer 7	19.2K	$4,600 to $12,000
ComDesign, Inc. **Goleta, Calif.**	NS 2000 Network Server	Any FutureCom Ethernet local network to same or to remote asynchronous host	Not applicable	Asynchronous	128	OSI Layer 4	64K	$2,100 to $9,600
Communication Machinery Corp. **Santa Barbara, Calif.**	DRN 3200	Ethernet TCP/IP to DDN/ARPANET	Not applicable	TCP/IP, X.25 Layer 3	100	OSI Layer 3	19.2K on packet networks; 64K on wide-area networks	$11,900
Communications Solutions, Inc. **San Jose, Calif.**	Access SNA/APPC	Any workstation to SNA	Any IBM PU 2.1, LU 6.2	SDLC	508	SNA Layer 7	9.6K	$200
	Access/SNA 3270	Any workstation to SNA	IBM 3274/3278, 3279, 3287	SDLC	254	SNA Layer 7	9.6K	$200
Corvus Systems, Inc. **San Jose, Calif.**	DUZ Gateway	Corvus Omninet local network to local Digital Equipment Corp. VAX	DEC VT52, 100, 220	Asynchronous	24	OSI Layer 7	1M	$5,495
CXI, Inc. **Palo Alto, Calif.**	PCOX GW-3270 Coax Mux	Any IBM NETBIOS local network to IBM 3274	IBM 3278, 3279, 3287	SNA/SDLC and non-SNA	40	SNA Layer 6	2.38M coaxial connection	$2,000 (single session) to $5,000 (40 sessions)
	PCOX GW-3270 Remote Assist	Any IBM NETBIOS local network to SNA	IBM 3274/3278, 3279, 3287	SNA/SDLC	64	SNA Layer 6	19.2K	$2,000 (single session) to $5,300 (64 sessions)

Gateways (continued)

Vendor	Product	Connectivity	Emulation	Protocols	Simultaneous sessions	Layer/level support	Trunk speed (bit/sec)	Price
Data General Corp. Westborough, Mass.	DG/TCP/IP Gateway	Any Ethernet TCP/IP local network to any local network running TCP/IP	Not applicable	TCP/IP, X.25 Level 3	Not applicable	OSI Layer 7	19.2K on packet networks; 10M local network connection	$500 to $3,500
	DG/SNA	Any DG MV minicomputer to IBM SNA	Any IBM PU 2, LU 0, 1, 2, 3, 6.2	SDLC, X.25 Level 3	254	SNA Layer 7	19.2K on packet networks; 56K on wide-area networks	$1,000 to $5,000
Datapoint Corp. San Antonio, Texas	Vista-gate	Any Datapoint local network to SNA	Any IBM PU 2.1, LU 1, 2, 3, 6.2	SDLC, X.25 Level 3	30	SNA Layer 6	64K	$4,495
Digital Communications Associates, Inc. Alpharetta, Ga.	IrmaLAN to SDLC Gateway	IBM Personal Computer to SNA	IBM 3274/3278, 3279	SDLC	32	SNA Layer 7	19.2K	$1,195
	IrmaLAN DFT Gateway	Any IBM-compatible NETBIOS via Ethernet to SNA	IBM 3274/3278, 3279	SDLC	20	SNA Layer 7	10M (Ethernet)	$1,195
Digital Equipment Corp. Maynard, Mass.	DECnet to SNA Gateway	DEC VAX to SNA	Any IBM PU 2, LU 0, 1, 2, 3, 6.2	SDLC, SNADS	Not available	SNA Layer 7	56K	$14,000 to $18,000
DSC Nestar Systems, Inc. Mountain View, Calif.	Asynchronous Server Version 2.0	Nestar Plan local network to any asynchronous host	Any asynchronous terminal	Asynchronous	16	OSI Layer 7	19.2K	$6,000
	SNA Gateway Version 3.0	Nestar Plan local network to SNA	IBM 3274/3278, 3279	SDLC	16	SNA Layer 7	19.2K	$3,000 to $5,000
Fox Research, Inc. Dayton, Ohio	10-Gate Turbo	TenNet local network to SNA	IBM 3274/3278, 3279, 3286, 3287, 3289	SDLC	32	SNA Layer 7	19.2K	$1,995
Gateway Communications, Inc. Irvine, Calif.	G/SNA Gateway	Any advanced Novell, Inc. NetWare local network to SNA	IBM 3274/3278, 3279, 3770	SDLC	32	SNA Layer 5	56K	$2,530 to $4,530
Harris Corp. Data Communications Division Dallas	9300 Communications System	HarrisNet local network to SNA	Any IBM PU 2.1, LU 0, 1, 2, 3, 6.2	SDLC, BSC, HASP, SNADS	128	SNA Level 7	56K	$8,000 to $12,900
Hewlett-Packard Co. Cupertino, Calif.	HP-UX Gateway/SNA 3270	HP 9000 to SNA	IBM 3274/3278, 3289	SDLC	50	SNA Layer 6	19.2K	$7,140
Intelligent Technologies International Corp. Foster City, Calif.	Gateway Exchange	Any IBM NETBIOS local network to SNA	IBM 3274 or 3276/3278, 3279, 3287, 3770	SDLC, BSC	64	SNA Layer 7	9.6K	$1,995 to $3,495
Micom-Interlan, Inc. Foxboro, Mass.	TCP Local Gateway	Novell NetWare file server to any TCP/IP local network	DEC VT 52, 100, 220, HP 2600, Televideo Systems, Inc. 925	TCP/IP	32	OSI Layer 7	10M (direct Ethernet)	$3,995
Netlink, Inc. Raleigh, N.C.	SNA Gate	Any asynchronous or BSC host to SNA	IBM 3101, 3274/3278, 3279, 3287, 2780/3780, DEC VT 100	Asynchronous, BSC, SDLC, polled asynchronous	16	SNA Layer 6	64K	$4,000 to $9,500
Novell, Inc. Orem, Utah	Novell NetWare Remote Bridge X.25	Any NetWare-controlled local network to same	Not applicable	X.25	32 or 256	OSI Layer 4	64K	$1,995 or $2,995
Orion Network Systems, Inc. Berkeley, Calif.	SNA 6.2 Release 3 Gateway	Any workstation to SNA	Any IBM PU 2.1, LU 0, 1, 2, or 6.4	SDLC	Unlimited	SNA Layer 7	56K	$200 to $3,000
Proteon, Inc. Westborough, Mass.	Model 4200	Any IEEE 802.3 Ethernet, ProNet 10 or 80 or ARPANET 1822 to each other	Not applicable	Ethernet	Not applicable	OSI Layer 3	2.048M	$8,000 to $24,000
Rabbit Software Corp. Malvern, Pa.	Rabbitgate	Any remote IBM NETBIOS local network to SNA	IBM 3274, 3276/3278, 3279, 3287, 3770	SDLC, BSC, SNA/X.25 Level 3	32	SNA Layer 7	19.2K on packet networks; 56K on wide-area networks	$2,395
3Com Corp. Mountain View, Calif.	3+/Asynchronous	3Com or IBM Token-Ring, 3Com Ethernet to any asynchronous host	IBM 3101, DEC VT 52, 100, 220	Asynchronous	2	OSI Layer 7	19.2K	$1,795
Software Results Corp. Columbus, Ohio	Comboard/SNA	DEC VAX or Micro VAX to SNA via Ethernet, direct connect to host or remote connection	IBM 3274/3278, 3287, 3777	SDLC	30	SNA Layer 7	56K	$3,500 to $9,500 for Q-bus version; $4,500 to $15,500 for Unibus version
	Comboard/HASP	DEC VAX or Micro VAX to IBM BSC via Ethernet, direct connect to host or remote connection	IBM HASP workstation	BSC	255	SNA Layer 2	56K	$6,500 to $24,500 for Unibus version; $3,500 to $9,500 for Q-bus version
Token Associates, Inc. Bedford, Mass.	MAP/X.25	MAP broadband or baseband local network to X.25 or to another MAP local network	Not applicable	MAP, X.25 Layer 3	32	OSI Layer 7	56K	$21,000
Tri-Data Corp. Mountain View, Calif.	Netway 1000A	Apple Appletalk to SNA/SDLC or BSC	IBM 3274/3278	SDLC, BSC	16	SNA Layer 5	19.2K	$3,195
Ungermann-Bass, Inc. Santa Clara, Calif.	Net/One X.25	Ungermann-Bass 802.3 Net/One to X.25	Not applicable	X.25 Level 3	32	OSI Layer 5	64K	$9,025 (baseband); $9,050 (broadband)
Wang Laboratories, Inc. Lowell, Mass.	SNA Networks	Wang VS superminicomputer to SNA	IBM 3274/3278, 3279, 3777	SNA/SDLC	Unlimited	SNA Layer 7	56K	$2,000 to $6,000
	DISOSS	Wang Office to IBM DISOSS	Not applicable	LU 6.2	Unlimited	SNA Layer 7	19.2K	$5,400 to $10,000

APPC = Advanced Program-to-Program Communications
ARPANET = Advanced Research Projects Agency Network
BSC = Binary Synchronous Communications
MAP = Manufacturing Automation Protocol
NETBIOS = Network Basic I/O System
OSI = Open Systems Interconnect
SDLC = Synchronous Data Link Control
SNA = Systems Network Architecture
SNADS = Systems Network Architecture Distribution Services
TCP/IP = Transmission Control Protocol/Internet Protocol
XNS = Xerox Network System

Apple Computer, Inc. and IBM were unable to supply product information by press time.

NOTE: Products listed are representative for each vendor. Many vendors offer other systems that could not be included due to space constraints. Readers should contact vendors directly for more information.

From page 33

with personal computer or standalone communications servers. The bridges listed link local nets and are stand-alone units.

Functional confusion

Some users' confusion as to what differentiates bridges and gateways stems from vendor hype about using protocol converters and routers as bridges or gateways.

■ **Bridges.** A local-area net bridge, operating at Open Systems Interconnect (OSI) Layer 2, links products that use identical protocols. In addition, the address on each local net must be different. The packet frame size must be the same, or the packets won't be handled correctly.

A bridge connects distinct physical networks into one logical net, and all devices can address all others — unless user-imposed restrictions are implemented.

A bridge can act as a point-to-point store-and-forward device that accepts packets, checks their destination address in an internal table and forwards packets addressed to another local net. Packets are filtered according to destination address and by user-defined parameters. The packet filter rate shown in the product comparison chart is based on an Ethernet packet size of 763 bytes and a token-ring packet size of 1,000 bytes.

Bridges are also used to connect multiple local-area nets.

Bridges are also used to connect multiple local-area nets. In such applications, the bridge on the output side of each local net checks the address of each originating packet. If the destination is a workstation on another local net, the packet is passed to the next logical local net. This allows each bridge to store only the destination addresses of the workstations on its local-area net, rather than all addresses in the logical network.

When evaluating a bridge, remember that address checking and other internal functions will delay the forwarding of packets, reducing the volume of packets handled over any time period. This accounts for the difference between the "Packet/sec filtered" and "Packet/sec forwarded" ratings in the product comparison chart. Most bridges are fast enough not to delay packets to the point at which applications will suffer. However, for time-sensitive applications and in cases in which bridges are joining remote local-area nets, packet throughput can be an important consideration.

Users wanting to link Ethernet local nets should be especially cautious of the Ethernet version supported by a bridge, since some versions can't communicate.

According to Gerry Sawkins, manager of sales support for Ungermann-Bass, Inc., the media access control specification of IEEE 802.3 Ethernet uses a two-byte length of field, while Ethernet Versions 1 and 2 use the same address location for the type of field. For that reason, the 802.3 version can't communicate with Versions 1 and 2. Both local-area network types, however, can exist on the same network, according to Sawkins. Organizations that have both Ethernet versions in use can link each version to other similar nets, but not to each other.

Some bridges are smarter than others in that they dynamically learn the location of different stations rather than require the user to program their locations. The advantage of smart bridges is that devices can be added or deleted, and the bridge routing tables are automatically updated.

■ **Routers.** A router is neither a bridge nor a gateway but provides some services of both. A router operates at the network layer (OSI and Systems Network Architecture Layer 3) and can route packets between multiple networks that use different protocols. Since routers, like bridges, must determine where the packets are to be sent, they also suffer packet-forwarding delays.

Routers perform packet segmentation and reassembly to accommodate intermediate networks in which packet sizes are different. They can selectively transmit packets based on urgency and allowable transmission delay. In the product comparisons, routers are listed with gateway products, but they don't support protocol conversion or provide support above the OSI network layer and SNA path-control layer. Routers can be identified by their OSI Layer 3 support-level designation under "Layer/level support" in the comparison chart.

■ **Gateways.** Gateways are the most sophisticated products in this group, providing support through all seven layers of a selected network architecture, such as the OSI model or IBM's SNA. Gateways link networks with dissimilar pro-

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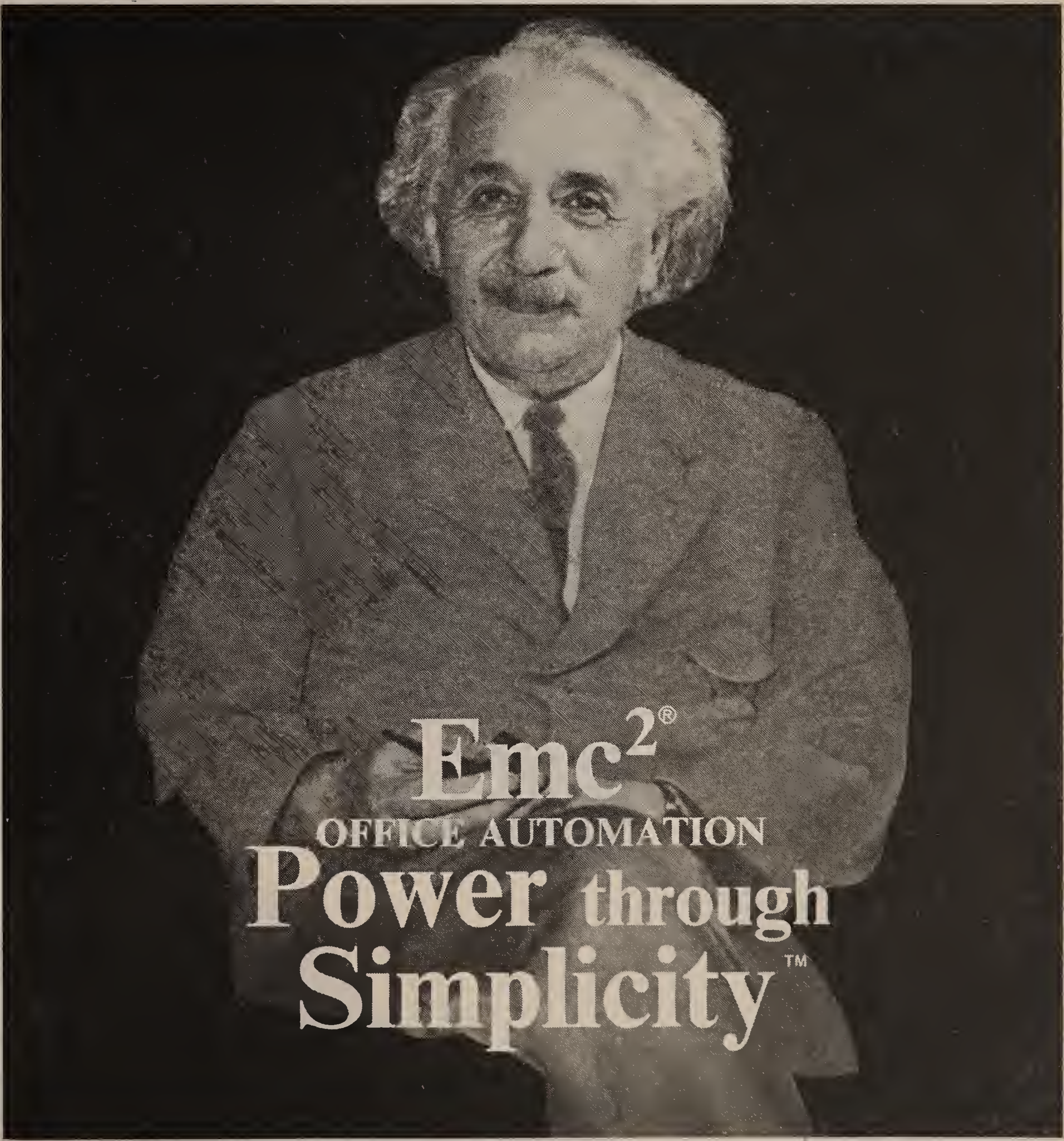

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tocols and use component emulation to do the job. By far, the most common emulation involves IBM's 3X74 controllers, 3X78 and 3X79 workstations, and 328X printers. In addition, remote job entry applications are handled by IBM 2780/3780 and 3777 emulation. While available for both local and remote communications, most gateways are intended for remote sites.

Some protocol converters are being passed off as gateways, since they're capable of emulation and file transfers.

However, such products are not full-function gateways. Tom Orsborn, product manager for Harris Corp.'s Harris 9300, states that full-function means that an operation can be initiated at either end of the network. An IBM 3270, for example, can initiate a session with a host but not vice versa, Orsborn says, and therefore "gateways that only emulate the 3270 are not full-function."

George Colony, president of Forrester Research, Inc., a Cambridge, Mass., market research and consulting company, says he agrees that emulation and file-transfer capabilities do not a full-function gateway make. "Reverse pass-through [the ability to initiate a call in either direction] requires a host command facility such as that used by DEC, along with something like LU 6.2," Colony emphasizes.

No simple implementation

Unlike gateways and protocol converters, bridges and routers can be installed with little or no user programming. Simple gateways that are little more than protocol converters usually require the least user involvement, while those employing LU 6.2 could require programming services that most users won't have in-house.

That doesn't mean that something as simple as IBM 3270 emulation won't require user-supplied programming. As noted in the May 11 issue of *Network World* ("Protocol converters feel peer pressure"), the data processing staff may be required to write routines that convert host data into a form personal computer applications can use. This is especially true for file transfers, since data conversion — ASCII to EBCDIC and vice versa — and file blocking and unblocking are usually involved. However, for interactive applications such as those implemented on the 3270, user programming effort should be minimal.

Some protocol converters are being passed off as gateways, since they're capable of emulation and file transfers.

A problem might occur when the gateway environment involves a local-area net. A large East Coast services company, which declined to be identified, says it tried several 3270-emulating gateways with its Novell, Inc. NetWare operating system, but the products didn't work together. As it turned out, the NetWare release installed was incompatible with the gateway software, and the vendors being considered hadn't updated their products. Although checking operating release levels for compatibility seems basic, users shouldn't assume vendors are up-to-date.

Implementing LU 6.2 gateways is usually a job for pros, especially if the application is unusual or

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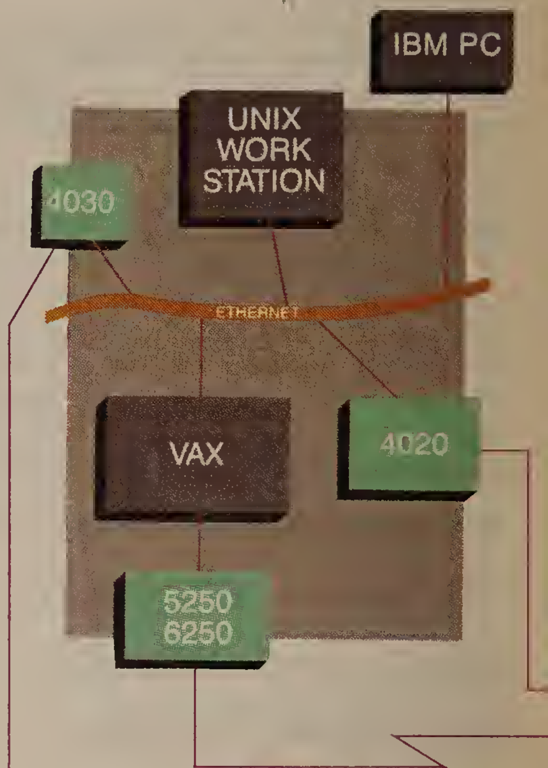

the gateway vendors don't provide suitable support. According to Forrester Research's Colony, LU 6.2 applications require users to write their own Application Program Interface (API), and that, in turn, necessitates a knowledge of LU 6.2 and API procedures. Most end users aren't familiar with either, Colony says.

Despite the programming effort required, gateway products are still the easiest way to link diverse networks.

If writing APIs is too difficult, what about interfacing applications using LU 6.2? Charles Robins, senior vice-president of Rabbit Software Corp., a Malvern, Pa., vendor of communications software/hardware products, says, "The LU 6.2 verbs are powerful, but you need to build applications that can manipulate them. Some vendors provide such support for their customers, while some don't." Those who don't put the burden on the user.

One user who can attest that writing APIs is not for amateurs is Mike Baker, director of distributed systems for Baxter Healthcare Corp. in McGaw, Ill. Baxter's network employs Communications Solutions, Inc.'s (CSI) Access SNA/Advanced Program-to-Program Communications as its communications server gateway. It supports some 2,000 workstations networked on 150 token-ring local-area nets, with each local net acting as a server.

"We were putting on some new applications at the time we got the CSI products, so we wrote the interface between NETBIOS and APPC," he explains. "We have a few sophisticated systems programmers who knew what to do, so we handled the interface ourselves. However, you'd better know what you're doing." Baker says the CSI staff was helpful and could have handled the job, but, since he had the resources, it was easier to have his staff write the interfaces.

Does this mean that prospective LU 6.2 users are shut out unless they have top-flight talent or outside consultants to handle the interfacing? "Not at all," Colony says. "Some standard applications like querying a data base will have a standard API that's not hard to write. Some [LU 6.2] vendors may have those interfaces already." Colony went on to mention that, for special applications such as user-written accounting and order-tracking packages, users might very well be on their own.

Summary

Despite the programming effort required, gateway products are still the easiest way to link diverse networks, and they're worth the effort. In addition, vendors interested in getting users' business will certainly help out with the API, provided the vendor has had experience with similar applications. In the future, some of the more common applications, such as data base interaction, will likely have standard APIs that are easily implemented.

While all of that seems promising, the widespread acceptance of gateways might be dampened by the lack of a single network monitor. Currently, there's no standard monitor and control scheme, so users are saddled with different

Continued on next page

It's all here...

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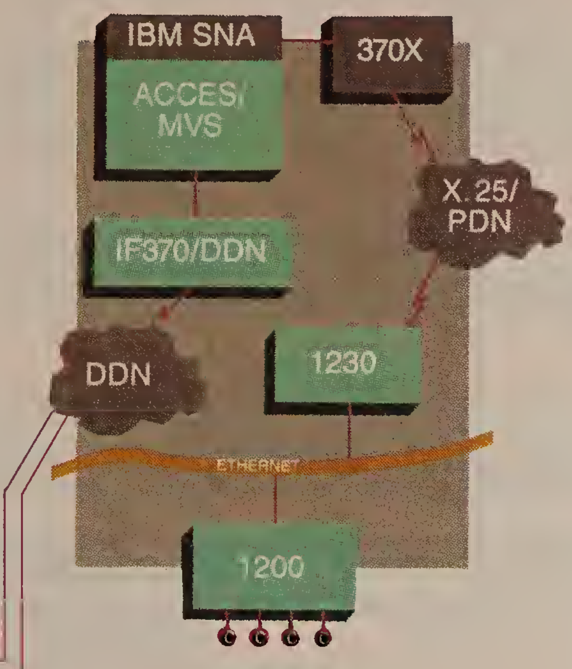

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Bridges

Vendor	Product	Local-area network connection	Packet/sec filtered	Packet/sec forwarded	Filter restrictions	Statistics	Price
Advanced Computer Concepts, Inc. Santa Barbara, Calif.	ACS 4030	Any remote Ethernet local network to same	256	100 to 250	Destination address	Total packets, packets passed, bad packets	$4,975
Applitek Corp. Wakefield, Mass.	NI 10/E	IEEE 802.3 Ethernet to same or Xerox Corp.'s Ethernet	Not available	600	Destination address	Total packets, packets forwarded, bad packets	$12,500
Banyan Systems, Inc. Westborough, Mass.	VINES 286	Xerox Ethernet, IBM Token-Ring Network, Proteon, Inc. ProNet, Datapoint Corp. Arcnet, DSC Nestar Systems, Inc. Arcnet, Allen-Bradley Co. VistaLAN and Corvus Systems, Inc. OmniNet to each other	650	550	Destination address, protocol	Total packets, bad packets	$1,895
Bridge Communications, Inc. Mountain View, Calif.	IB/X Series	Any Ethernet to any Ethernet or broadband local network and vice versa	8,000	5,000	User-specified restrictions	Total packets, packets forwarded, bad packets	$10,000
Communication Machinery Corp. Santa Barbara, Calif.	DRN-3100	Transmission Control Protocol/Internet Protocol Ethernet local network to same	1,000	300	Destination address	Total packets, packets forwarded, bad packets	$5,990
Concord Communications, Inc. Marlborough, Mass.	Server 4100	Local or remote IEEE 802.4 local network to same	150	150	Destination address	Total packets, packets passed, bad packets	$9,950 to $11,900
Digital Equipment Corp. Maynard, Mass.	LAN Bridge 100	Local or remote Ethernet Version 2.0 to IEEE 802.3 Ethernet and vice versa	24,272	13,404	Destination address	Total packets, packets passed, bad packets	$8,800
Fast Feedback Technologies, Inc. Redondo Beach, Calif.	NetLink	Local or remote Fast Feedback MicroLAN to same	1,000	500	Destination address	Total packets, packets forwarded, bad packets	$500 to $1,400
Fox Research, Inc. Dayton, Ohio	10 Bridge	Remote Fox 10-Net local network to same	Not available	Not available	Destination address	Total packets, packets forwarded, bad packets	$295
Netways, Inc. Hauppauge, N.Y.	Bridge Plus	Local or remote IEEE 802.3 Ethernet local network to same	10,000	5,000	Destination address	Total packets, packets forwarded, bad packets	$5,695
Retix Santa Monica, Calif.	RetixGate 2244	IEEE 802.3 Ethernet to same	10,000	6,000	Destination address	Not available	$1,950
TRW, Inc. Torrance, Calif.	NB 2000	IEEE 802.3 Ethernet to same	10,000	5,000	Destination address	Total packets, packets forwarded, bad packets	$5,395
Ungermann-Bass, Inc. Santa Clara, Calif.	Token Ring to Ethernet	IEEE 802.5 to Ethernet	Not available	Not available	Destination address, user-defined restriction	Total packets, packets forwarded, bad packets	$8,550; $990 for software
Vitalink Communications Corp. Freemont, Calif.	TransLAN	Any Ethernet local network to same	15,000	2,500	Destination address, packet type, multicast address, user-specified code	Total packets, packets forwarded, bad packets	$15,750
Zenith Data Systems Glenview, Ill.	ZanLAN 500 BRG	Remote Zenith ZLAN 500 broadband local network to same	Not applicable	Not applicable	Destination address	Packets passed, bad packets	$10,000

NOTE: Products listed are representative for each vendor. Many vendors offer other systems that could not be included due to space constraints. Readers should contact vendors directly for more information.

SOURCE: TMS CORP., DEVON, PA.

From previous page

monitors for each network segment. Local-area nets have their own network management systems, and so do the networks they interface with.

"What exist are network management systems that can't talk to each other, so there's no single point of control," Colony says. Rabbit's Robins says some standard must be agreed upon, and — like Colony — he says he thinks IBM's NetView has the best shot to date at becoming that standard. ☑

Letters:

Editor:

We were disappointed not to find our firm mentioned among seven others in your Aug. 31 feature article on network design and optimization ("Mapping the optimal network," *NW*, Aug. 31).

John W. Bridges & Associates, Inc. (JBA) markets software and performs network design and consulting in all areas mentioned in your article: voice, data, packet and integrated networks. There are presently 24 installations of our software nationwide, with clients including two regional Bell holding companies and one of the largest interexchange carriers. Our software packages have been used for designs of some of the largest networks in the country, and JBA has won major competitive bids against several firms mentioned in your article.

John W. Bridges
John W. Bridges & Associates
Lewisville, Texas

Editor:

In the Service Focus on digital data services in the Aug. 10 issue of *Network World* ("Son of DDS"), a statement is made that in "local- or metropolitan-area digital services. . .not a lot has happened. . .the rest of these ventures are all 'paper networks.' "

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We also have an earth station complex that can house 36 domestic and international C-band antennas, and we are a West Coast communications (voice, video and data) gateway to Europe, Latin America and the Pacific rim.

John Harrison
General manager
Bay Area Teleport
Alameda, Calif.

Editor:

I would like to bring some clarification to a statement in your Sept. 21 Service Focus article on T-1 services, "Tariffed, nontariffed options produce T-1 market turmoil," written by Robert Ellis. In his otherwise excellent article, Mr. Ellis makes reference to our company, Digital Signal, Inc., as a "T-1 reseller" that "acquire[s] T-spans in large bundles. . .and then resell[s] individual T-1s." This leaves the general impression that Digital Signal is a broker that merely buys and resells a commodity.

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President
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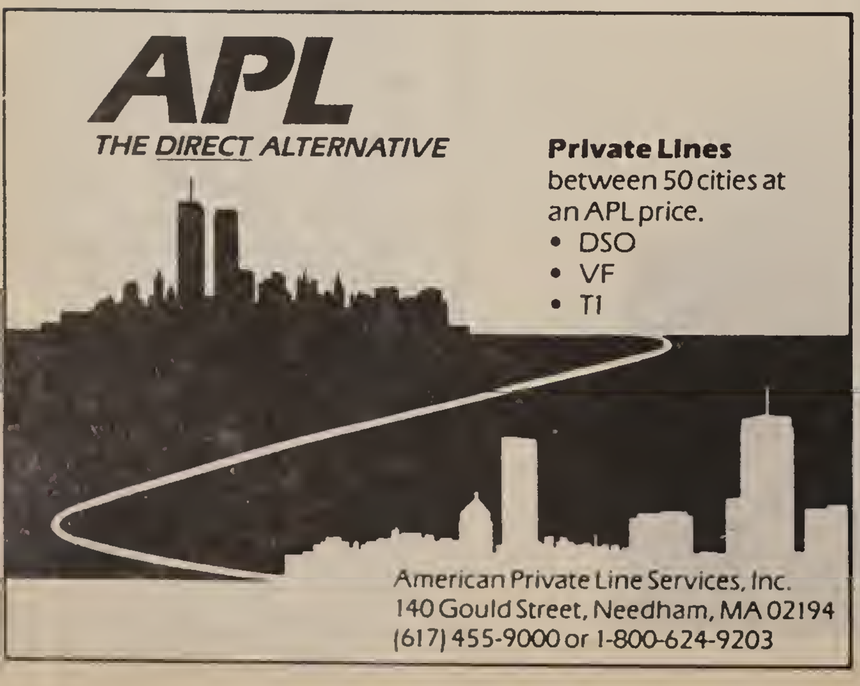
Letters may be edited for space and clarity.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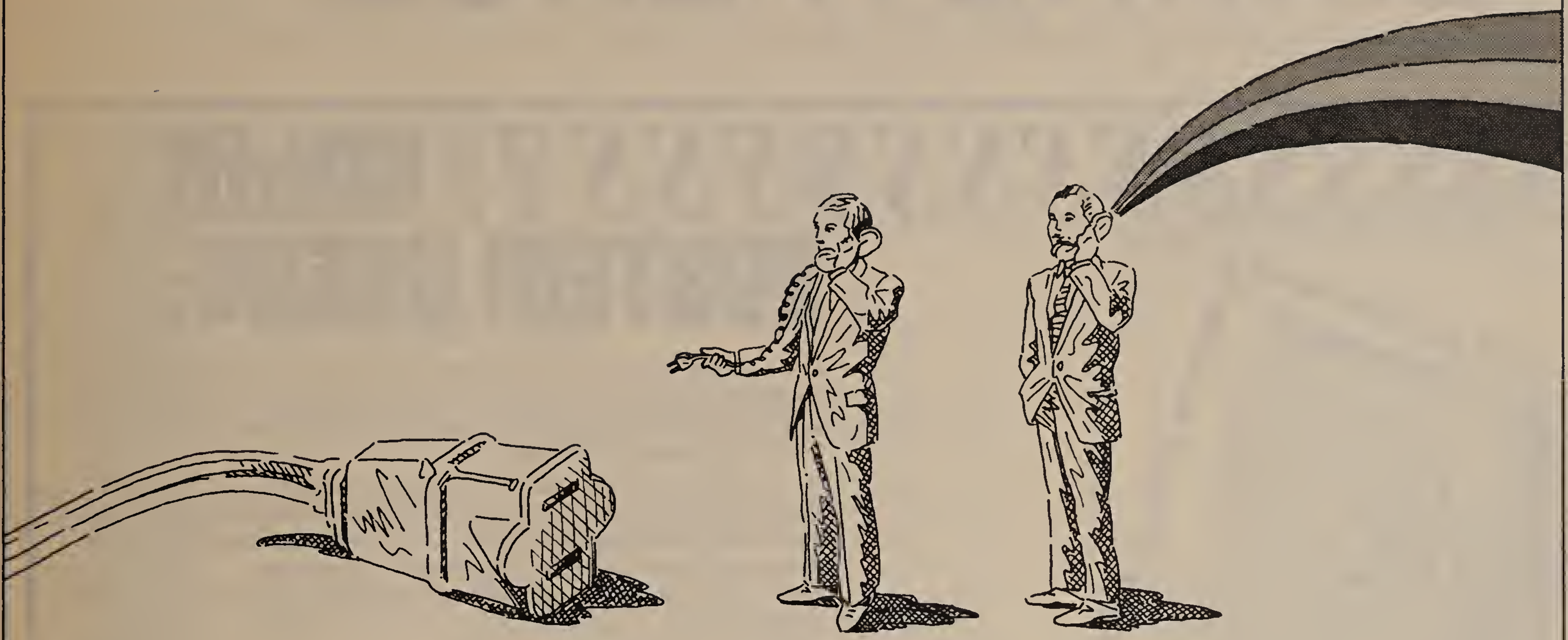

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Design and implement basic systems software or significant subsystems in support of a fast growing scientific user community at the CNSF. Provide technical support in use of system components, including maintenance, documentation, performance measurement, and staff training. Requires coordinating with vendors, staff and other Cornell departments. Working knowledge of IBM/370 assembler and VM/CMS essential. Scientific computing background a must.

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Send cover letter and resume to: Judith Deane, Staffing Services, Dept. CNSF-CW, Cornell Theory Center, CORNELL UNIVERSITY, 160 Day Hall, Ithaca, NY 14853.

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Los Angeles Times

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Apply by October 9, 1987. Call **602-435-4121** for an official application or send resume to:

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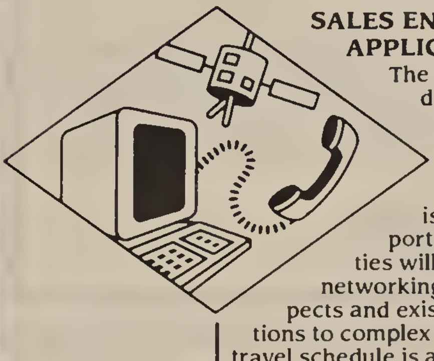

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Los Angeles Times

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Access fees rock user strategies

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could have a serious impact on private networks. They voiced concern that state public utility commissions will follow the FCC's lead and apply similar access charges for intrastate calls.

The FCC has proposed lifting the access charge exemption that packet network operators now enjoy, charging them for access to local exchange facilities just as with long-haul carriers. But in its proposal, the FCC said its objective is to recover costs of local exchange access from all users, regardless of their designation as carriers, enhanced service providers or private customers.

If corporations become subject to the proposed access charges, it "will completely alter the way businesses use telecommunications," said Michael Woody, vice-president for regulatory affairs for TCA. "Rates are going to go right through the ceiling," Woody maintained. "The proposal will ultimately eliminate private lines. You might as well just use dial-up — there will be no economies of scale."

Woody is manager of communications services for a truck manufacturer that uses private lines for data and is also a large user of public packet-switching services. He asked that his company not be named. The company's dealers use the packet-switched network to place orders, and Woody said he believes his company might absorb the additional access charges, rather than pass them on to dealers.

Financial service providers Visa USA, Inc. and MasterCard International, Inc. believe the access charge would not only increase the prices for financial services but would also curtail introduction of new services.

Visa and MasterCard, in conjunction with the California Bankers Clearing House Association and the New York Clearing House Association, detailed their objections in comments submitted recently to the FCC.

Electronic credit card authorization, debit card transactions, electronic funds transfer and home banking are financial services that would be affected by the access charges, said Jerry Appleby, assistant vice-president for Security Pacific Automation Co. "I do not consider myself a carrier. Yet, now it looks like I'd be treated like one," he said.

If users are charged the eight cent-per-minute access charge currently levied on interexchange carriers, Visa and MasterCard together could face $200 million of access charges annually, according to figures compiled by Morrison & Foerster, the Washington, D.C.-based law firm representing Visa, MasterCard and the banking associations.

"The impact is not just on the banks but on the merchants and all their customers," Appleby noted. "The banks would more than likely pass that cost back to the merchants, who would pass it back on to consumers. If the proposal goes through, there will be a dramatic rate shock in this industry."

Extending access charges to companies such as financial service providers, whose customers employ local exchange carriers to dial into private networks, presents a number of sticky problems, said Hank Levine, a partner with Morrison & Foerster.

"To develop a tracking mechanism would be virtually impossible," Levine said. Service providers could avoid the access charges by reconfiguring their networks so that interstate calls are avoided or by bypassing the local exchange carriers and directly tying to the interexchange carriers.

Or, in a return to past methods, credit card authorizations could be given by an operator stationed within a local exchange, Appleby said. The operator could do credit card checks over a private network and, as long as no switching is done, the access charge would be avoided.

Macy's California, Inc. has a T-1 network carrying integrated voice and data traffic to 30 sites in the state. Point-of-sale information and credit card authorizations are among the data carried on the network.

Donna J. Parker, vice-president, telecommunications for Macy's, said she wonders whether voice traffic will be exempt from the access charge or whether the entire net will be considered a data network.

Doelz vs. AT&T in $25m suit

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proved, the suit alleged.

It wasn't until after the meeting that AT&T proposed its own data communications equipment in place of Doelz's hardware, the suit stated.

Doelz claimed AT&T used the confidential information that was presented in the meeting in order to persuade the bank to switch suppliers.

The bank informed Doelz about the change at the end of September.

The suit charged AT&T with seven violations: inducing breach of contract, interference with prospective economic advantage, unfair competition, misappropriation of trade secrets, breach of fiduciary duty, violation of the Uniform Trade Secrets Act as well as violation of the business and professional code.

The suit said Doelz lost revenue anticipated from the sale to Bank of America and lost sales to other customers.

Doelz also incurred unnecessary expenses, such as hiring staff to meet the anticipated demand for its products.

The lost contract also prevented the company from raising additional capital, and the value of the corporation has been damaged because of the lost revenue, Doelz claimed. The suit said damage to the company totals more than $25 million.

The defendants have 20 days to file a response to the suit, according to Richard G. Braman, a lawyer with Gray, Plant, Mooty, Mooty & Bennett, P.A., a Minneapolis firm that is representing Doelz.

Braman said the two parties have been talking about an out-of-court settlement since last summer and may continue to do so until the case comes to trial in approximately one year.

Chevron in first test of PRI

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list" of applications it wants to test, Houghton said, but he would not elaborate on them.

"We're not sure what we'll uncover. ISDN is coming, and we want to be at the forefront so we're in a position to take advantage of any capabilities as soon as possible," he said.

Northern Telecom will upgrade the SL-1 by adding one interface card to the PBX for the primary rate link and a second card to accommodate the D channel, according to Jean Poirier, product manager for ISDN.

The upgrades will cost from $15,000 to $35,000, depending on configuration. Appropriate software will also be provided. The DMS-100 will be upgraded in a similar fashion.

"ISDN introduces intelligence into the networks and extends that intelligence to customer premises," Poirier said. Ultimately, this will allow users greater control over their networks, including the ability to dynamically reconfigure them.

Poirier differentiated the Pacific Bell test from other telephone companies' tests of primary rate access by stressing Pacific Bell's focus on providing local exchange connectivity to a commercial customer.

AT&T, Poirier said, is conducting internal tests of the Primary Rate Interface.

New software

Also at the TCA show, Northern Telecom introduced a new software release for the SL-1. Generic XII Release 10, combines applications for several vertical industries. It will be available in the first quarter of 1988 and priced according to configuration.

Hughes takes flight

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Although the corporate VLSI support organization initially only supported wide-area links for VLSI engineering at five or six sites, their responsibilities quickly grew. "Now we're supporting all engineering work, and we're also supporting internal departmental and MIS work," Covert said. "Ethernet is a good medium to support any kind of data."

Covert's group also supports the belief that Ethernet is an easy and cost-effective medium to extend. "It's easy for other users to tap onto it," said Alexis Bor, a network consultant. "Putting in dedicated circuits for individual connections is a lot more expensive."

Although Ethernet is the transport medium of choice for most of Hughes' local net users, a growing number of different networking protocols running on top of Ethernet. "Once the Ethernet is there, it's very simple to add another software protocol on it," Covert said.

"Initially, we were going to support DECnet and TCP/IP, which is what the VLSI community was using," Covert said. "Since then, more protocols have become available between workstations and PCs. We're gradually supporting them as they become available. In a company the size of Hughes, you can't impose a single networking standard. You have to support what the departments are going to get." Covert's group plans to support any networking protocol that requires an area addressing scheme, such as that used in DECnet and in Transmission Control Protocol/Internet Protocol. "Because such a scheme requires that every user have a particular number and name, it's necessary to have centralized organization to ensure that no one reuses the same number and name," Covert said.

Centralized management of such an installation has proven to be the biggest challenge Covert's organization has faced — and the weakest area of local network technology.

"There are absolutely no management tools available now, except for a few diagnostic tools," Covert said. "We have no way of measuring traffic patterns, doing troubleshooting or capacity planning and monitoring network performance. It's very hard to get accurate, good samples of your network traffic when most of the devices you have can't intercept every packet that goes through the network at 10M bit/sec."

None of the diagnostic tools available from networking vendors or third-party network diagnostic companies support more than one protocol over Ethernet, according to Bor. "None of the vendors seem to take the overall picture and say, 'I want to manage an Ethernet and all the protocols that run on that Ethernet.' " Bor said.

"Ethernet was designed for local-area networks, which means it has a certain distance limitation," Covert said.

"No one planned to make it a wide-area network, such as what we have now," he said. "Hardware vendors have since come out with ways to extend Ethernet's distance all the way across the country. Now the software vendors have to catch up with ways to monitor and control these networks."

Co-op inks cut-rate PBX pacts

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tracts on their own," said Edward Horrell, president of Memphis, Tenn.-based Econocom Telecommunications Corp., which markets computer and communications equipment.

Amerinet is a nationwide cooperative formed a year ago to provide member hospitals and other health care providers with administrative and group purchasing services. Amerinet acts as a broker between its members and vendors of capital equipment, pharmaceuticals and other products.

Under the terms of the PBX contracts, Amerinet members will jointly purchase approximately $100 million worth of PBXs from both NEC and Northern Telecom during the next 18 months, according to Arlene DeGroodt, vice-president of Amerinet's capital equipment division. DeGroodt said the contracts are expected to be extended over three years and could involve $500 million worth of PBX purchases.

NEC has guaranteed Amerinet members a 43% discount off the list price of its PBXs, and Northern Telecom agreed to a 40% discount.

Amerinet's PBX purchase agreements are the first step in a long-term communications program. The organization will also provide members with telecommunications consulting services and will attempt to arrange volume discounts on other communications equipment and services, DeGroodt said.

Future projects include joint purchases of transmission services, local networks, computer software and hardware, telephone answering services and coin telephones.

"Our goal is to provide support to our members that don't have in-house expertise in the increasingly complex area of telecommunications," DeGroodt said. "By combining our purchasing power, we felt we could take better advantage of competitive pricing in the telecommunications industry.

"Group purchasing has been used by the health care industry for some time to help drive down costs for small and medium-sized health care organizations," she added. "We are just beginning to see it used for telecommunications purchases."

Telecommunications analyst Walter Ulrich, a partner in the Houston office of Coopers & Lybrand, applauded Amerinet's actions. "This is a good idea for the health care industry," he said. "There's a tremendous consolidation taking place in health care, particularly due to cost-cutting pressures. Large hospital groups that serve many small hospitals are trying to leverage their joint economic power."

Amerinet's PBX purchase agreements are the first step in a long-term communications program. The organization will also provide telecommunications consulting services and will attempt to arrange volume discounts on other communications equipment and services, DeGroodt said.

Ulrich said he sees this trend spreading to other industries. "This is an attractive concept for small and medium-sized businesses that share similar communications needs. But I don't think this approach will work for companies with unique and proprietary communications requirements," he said.

The group approach to purchasing makes major vendors sit up and take notice. "The major telecommunications service providers, equipment vendors and consultants are all interested in large accounts. When companies come together as one large entity, they are going to command the attention of the vendor community — much more so than any individual company would on its own," Horrell said.

Amerinet opted for a group approach to PBX buying after surveying its members. "We found that 62% planned to replace their telephone systems over the next three years, and 90% planned to give their business to NEC, Northern Telecom and Rolm [Corp.]," DeGroodt said.

As a result, Amerinet chose the NEC NEAX 2400 Information Management System and the Northern Telecom Meridian SL-1 line of voice/data PBXs. The NEAX 2400 supports up to 22,000 lines and SL-1 models support between 32 and 6,000 lines. Both systems will provide voice mail, electronic mail, facsimile, teleconferencing and data networking.

Amerinet members will buy PBXs from NEC and Northern Telecom distributors, since the manufacturers don't have direct sales forces. Amerinet has signed agreements with NEC distributor Universal Communication Systems, Inc. of Roanoke, Va., a subsidiary of BellSouth Corp.; and with Northern Telecom distributors Pacific Telesis Group, Ameritech and Contel Corp. Maintenance, which is not included in the Amerinet contracts, will be handled by distributors.

CALENDAR

Oct. 5-6, San Francisco — The Fourth Annual Third-Party Maintenance Conference. Contact: Customer Service, Frost & Sullivan, Inc., 106 Fulton St., New York, N.Y. 10038.

Oct. 5-7, Oakland, Calif. — The Third Annual General Assembly of the World Teleport Association. Contact: JoDee Meyers, Conference Manager, World Teleport Assocation Conference Group, Bay Area Teleport, 1141 Harbor Bay Parkway, Alameda, Calif. 94501.

Oct. 5-7, Bal Harbour, Fla. — Pay Phone Expo '87 East. Contact: TeleStrategies, Inc., 1355 Beverly Road, McLean, Va. 22101.

Oct. 5-7, Chicago — The National Connectivity Symposium on Local-Area Networks & Micro-Mainframe Links. Also, Dec. 7-9, Washington, D.C. Contact: Digital Consulting, Inc., 6 Windsor St., Andover, Mass. 01810.

Oct. 13-14, Dallas — VAX Users Show Exposition & Conference. Contact: The Producers, 360 Merrimack St., Lawrence, Mass. 01843.

Oct. 14-15, Newport, R.I. — The Newport Conference on Fiber-Optic Markets. Contact: Newport Conference on Fiber-Optic Markets, KMI Corp., America's Cup Ave. at 31 Bridge St., Newport, R.I. 02840.

Oct. 14-16, Washington, D.C. — The Great International Celebration of Satellites in Space. Contact: Society of Satellite Professionals, P.O. Box 7154, McLean, Va. 22106.

Oct. 18-21, Phoenix — Systems Integration: The Business Challenge. Contact: Marcia Farrington, International Data Corp., 5 Speen St., Framingham, Mass. 01701.

Oct. 19-21, New York — SNA: Architecture, Products and Current Implementations. Also, Nov. 16-18, San Francisco. Contact: Information Breakthroughs, Inc., 445 W. Main St., Wyckoff, N.J. 07481.

Oct. 20-23, Montreal — MAP/TOP: A Comprehensive Technical Introduction and Status Report. Also, Nov. 3-6, Boston; Dec. 1-4, Los Angeles; Dec. 8-11, Ottawa. Contact: John Valenti, Integrated Computer Systems, 5800 Hannum Ave., Culver City, Calif. 90231.

Oct. 26, Dallas — WATS Alert: What You Must Know About the Latest Long-Distance Service Options. Also, Oct. 29, Chicago; Nov. 4, New York. Contact: BCR Enterprises, Inc., 950 York Road, Hinsdale, Ill. 60521.

Oct. 26-28, New York — The VAX Business User Forum. Contact: Dorothy Ferriter, IDG Conference Management Group, P.O. Box 9171, Framingham, Mass. 01701.

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Users wary of AT&T strategy

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proved by the Federal Communications Commission in August, and the new Virtual Telecommunications Networking Service (VTNS), filed with the FCC two weeks ago.

Both custom network services require commitment to a single carrier and the relinquishing of some network control. "You would be at the mercy of the carrier," said Robert Heinschel, a lead communications analyst with Chevron Information Technology Co.'s communications technology department. "Communications technology changes so quickly that you can't be locked into that type of service."

While here to discuss these and other recent industry developments, TCA members mulled a plan submitted at the meeting to restructure the association to position for its expansion into a national user organization.

TCA's board of directors accepted a five-year plan submitted by Rebel Kreklow, director of TCA's Northwest Chapter, that will transform TCA into a three-level organization consisting of local chapters, regional organizations and a national board.

The plan calls for standardizing chapter bylaws and establishing a mechanism for raising revenue while maintaining nonprofit status.

The one-stop shopping capabilities outlined in AT&T's tariffs were met with little interest by TCA members, despite the fact that the VTNS service has already attracted one corporate giant, E.I. DuPont de Nemours & Co., Inc. DuPont signed a three-year multimillion dollar contract for VTNS on Aug. 7 ("DuPont buys into new AT&T service," *NW*, Sept. 28).

VTNS — like the DTSS service originally filed as a private tariff to meet the needs of giant General Electric Corp. — empowers AT&T to create custom networks using any mix of services. AT&T offers the services under long-term contract and also provides network management services as part of the package.

Many users said the DTSS and VTNS services represent an effort by AT&T to stymie competitors by locking large users into long-term contracts, although others admitted VTNS would likely be attractive to companies that do not have the manpower or expertise necessary to manage and maintain networks.

"It is really a move to grab large customers and lock them into the service," Heinschel said.

Jack Allen, network services director for the Western region of McDonnell Douglas Aerospace Information Services Co. in Long Beach, Calif., sided with Heinschel. "It is a strong marketing strategy for AT&T to lock users into prices for current services." Allen said he was concerned that, with the cost of high-bandwidth transmission facilities plummeting, a VTNS user may have to pay the higher rate that was initially specified in the fixed-price, multiyear contract.

Allen said he blanched at the thought of handing control of the corporation's private voice and data networks to a single vendor. "We have purposely instituted a policy of not relying on a single vendor for equipment and services," Allen explained. "This is to prevent us from experiencing any problems, such as service outages and strikes, that could affect a single vendor."

He said the T-1 transmission facility market has become a commodity market, adding that reliance on a single carrier for all such services would erase the benefits of price competition in this marketplace.

Ron Scott, communications director for Cubic Corp., a maker of telemetering systems and radio communications equipment in San Diego, said he would be surprised if users with skilled telecommunications staffs would be interested in a VTNS-type service. "It is difficult to believe these users wouldn't want to retain control of their networks," he commented.

Scott's comments were echoed by Michael Woody, network and communications services manager for a manufacturer of heavy-duty trucks. Woody said his company is trying to gain a greater degree of control over its network.

"We're going in the opposite direction from those who would use [VTNS]," he said. "We must have internal control and management of our network."

Clint Childs, a telecommunications consulting analyst for Crowley Maritime Corp.'s information services group, also said his company would prefer to operate its own network. "We wouldn't want AT&T to design and monitor our network," he said. "AT&T is trying to target the old office services managers who have always relied heavily on AT&T for all [communications] services."

Despite the fact that the first customers for the customized AT&T services are two of the nation's largest companies, Gerry Taylor, a member of Apple Computer, Inc.'s field telecommunications support group, said VTNS may be most readily accepted by small users. "The service appears to be best suited for users with a small, in-house telecommunications staff or none at all."

IBM to revamp Rolm PBX design

continued from page 1

Rolm customers will be able to use their existing station equipment, the new switch architecture will render most CBX II components incompatible with the next-generation switch.

"This is a brand new switch with a new switching matrix that adheres to ISDN standards," said Fred Chanowski, president of Telecommunications Management, Inc. in Needham, Mass. Chanowski said he learned about the announcement through talks with IBM and large IBM users who have been briefed on the upcoming product introduction. "But it's also what I call forklift-upgradeable, which means you rent a forklift and haul the old CBX out."

The current Rolm CBX II is based on an architecture that grew out of Rolm's roots in the military computer market. Unlike other contemporary PBXs that use industry standard voice digitization techniques, the CBX II uses a proprietary 12-bit sampling method. The 12-bit sampling rate results in a digital voice channel of 96K bit/sec, less efficient than the 64K bit/sec standard realized using the common 8-bit sampling technique.

The 64K bit/sec standard is one of the basic building blocks of Integrated Services Digital Networks. This is one of the main factors that contributed to the long-held belief that Rolm would have to swallow a bitter pill and design an ISDN-compatible switch from the ground up.

In the past, both Rolm and IBM have vehemently denied there would be a major change in the CBX architecture, pledging always to provide a migration path for users of the switch. What's most unsettling to users, including key members of the National Rolm User's Group, is that they were not informed of the upcoming announcement — and some have recently invested in CBX II equipment.

A large Rolm user who requested anonymity said, "A lot of Rolm customers are very unhappy. One major customer signed a $5 million CBX II contract two weeks ago, and he is livid, I assure you."

Jay Silverberg, communications manager with Eastern States Bank Card Association, is disappointed, but sees the logic in IBM's decision to overhaul the switch's architecture. "It is unsettling from a short-range perspective when you know you have to scrap an expensive piece of equipment in favor of a new piece," he said. "However, it's a growth path. This is what Rolm needs to do to become state-of-the-art. Long-range, it isn't a tragedy, because if it's compatible with future technologies, that's a step in the right direction."

From a market perspective, according to John King, an independent consultant based in Carmel, Calif., the revamping of the architecture is an important step. "Rolm's gear is starting to look old. This move is absolutely necessary." He doesn't expect Rolm to lose its installed base of CBX II users. "For the next few years, people will just upgrade their CBX IIs, which can grow to twice their size, with lots of nice capabilities. ISDN isn't going to influence purchasing decisions for five years yet."

Although the switching matrix and the line cards will be incompatible with the new PBX, Chanowski said Rolm customers will be able to use their existing station equipment. "Rolm's proprietary station equipment link [Rolm Link 256] will be used in the new switch," Chanowski said. "Users will lose the PBX box but not their investment in station equipment."

Jerry McDowell, vice-president with consulting firm Vanguard Communications, Inc., in Carmel, Calif., affirmed that the new switch will require a "significant investment" from CBX II users, who will have to invest in new line cards. He said Rolm Link 256 will be used on the new product but will be enhanced.

Some sources said IBM will manufacture the Rolm PBX, and market it under the IBM label, a move that would fulfill recent predictions that the PBX maker will soon cease to function as a separate entity and be completely subsumed within IBM. If other reports about the new switch are correct, IBM's controlling hand in the PBX's development is evident. Frank Dzubeck, president of Washington, D.C.-based Communications Network Architects, Inc., said the switch will be an integral part of the SNA environment. "It will act as a full 3174, with local networking and T-1 capabilities," Dzubeck said.

"This switch is furthering IBM's plan to roll all its and Rolm's periphery products under SNA," McDowell observed. "IBM is doing it under the auspices of unified network management, with NetView controlling all the pieces."

Chanowski said he suspects the new product "will support somewhere around 30,000 lines, up from the CBX II's 20,000." Other sources confirmed that, while it will support a greater number of lines, the switch will have a significantly smaller footprint, as much as one-third smaller than the CBX II.

Sources said the PBX is scheduled for second- or third-quarter 1988 availability, a delivery schedule that will be met with skepticism by users, according to Chanowski. "Rolm in the past has been years late with introductions, and then the products haven't worked well when they came out."

IBM has kept mum about pricing information for the switch, but Chanowski said Big Blue has offered substitution clauses to key customers that recently purchased CBXs. "They're giving customers the new switch at the old CBX price," Chanowski said. He added that the price for the new switch will be as competitive as that for the CBX II.

But the anonymous user said the so-called substitution clause "is very vague and probably will do little to soothe customer wrath."

Another Rolm user who requested anonymity echoed that concern. "Rolm would be crazy to alienate its installed base, and it might be doing that. The minute my CBX II is obsolete and I need to take advantage of ISDN, I'll be in the market for an upgrade. If Rolm's upgrade is too expensive, I might look at other vendors' equipment."

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